Department of Toxic Substances Control

Edwin F. Lowry, Director
5796 Corporate Avenue
Cypress, California 90630

Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Gray Davis
Governor

MEMORANDUM

TO: Guenther Moskat
Unit Chief
Planning and Environmental Analysis Section
Department of Toxic Substances Control
P. O. Box 806
Sacramento, California 95812-0806

FROM: Robert M. Senga Original contains signature
Unit Chief
Geology and Corrective Action Branch
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, California 90630

SUBJECT: NOTICE OF DECISION FOR APPROVAL OF CORRECTIVE MEASURES FOR THE AEROJET ORDNANCE - CHINO HILLS FACILITY (EPA ID NO. CA981457302), CHINO HILLS, CALIFORNIA

DATE: October 17, 2000

Enclosed are the Notice Of Determination and related documents for the above facility project. This project was public notice in Spring 1999 and we are now making the final decision. The Initial Study was reviewed by Kathie Schievelbein of your office in Spring 1999.

NOD FILING CHECKLIST

This checklist outlines all the required contents of the Notice of Determination (NOD) pursuant to the California Environmental Quality Act (CEQA) and all required information for filing and payment of filing fees through the Planning and Environmental Analysis Section's (PEAS) CEQA Tracking Center (CTC). For further information regarding Notices of Determination, Initial Studies, Negative Declarations, Environmental Impact Reports, Findings of De Minimis, and Certificates of Fee Exemption, contact the PEAS Unit at (916) 322-8162 or CALNET 492-8162.

Instructions:

a) Review your NOD to assure it contains items 1 through 10.

NOTE: If you are also filing a Finding of De Minimis, use the combined Notice of Determination/Certificate of Fee Exemption form available from PEAS. Do not attempt to file a Finding of De Minimis unless you have consulted PEAS while conducting your Initial Study, and have documented your analysis of De Minimis conditions in the Initial Study checklist.

b) Fill in information requested in items 1, 3, 4, and 11 through 15.

c) Send this form along with items 16 through 21 to:

CEQA Tracking Center
Planning and Environmental Analysis Section
P.O. Box 806
Sacramento, CA 95812-0806

Contents of Notice of Determination:

_x_ 1. **Identification of the project including the common name, if any. Please also write the name of the project here.**

Approval of Corrective Measures, Aerojet Chino Hills Facility

_____

_x_ 2. **Signature of the Director, Deputy Director, or Branch Chief.** NODs for regulations should have the signature of

the Director or one who is designated by the Director to approve regulations.

_x_ 3 **State Clearinghouse Number.** The State Clearinghouse number is assigned by the Governor's Office of Planning and Research (OPR) State Clearinghouse when ten copies of a proposed Negative Declaration or draft Environmental Impact Report are sent to them for responsible agency review. If you cannot locate this number, call the State Clearinghouse at (916) 445-0613, CALNET 485-0613.

Write the State Clearinghouse number here, and include the State Clearinghouse number in the NOD.

____SCH #99041052_____

_x_ 4. **Date on which the Director, Deputy Director, or Branch Chief approved the <u>project</u>,** i.e., the date the permit, variance, Remedial Action Plan, Record of Decision, Standard 400 form (STD 400), etc., was signed by the Department.

Write the date here and include the date in the NOD.

October 17, 2000 _____

Site Mitigation - If both a Remedial Action Plan and a Record of Decision were approved, list both dates here, but only include the Remedial Action Plan date in the NOD.

_x_ 5. **Location of the project.**

_x_ 6. **Brief description of the project.**

_x_ 7. **Determination that the project will or will not have a "significant effect on the environment"** as that term is used in Section 15382 of Title 14 of the Natural Resources Code.

_x_ 8. **Indication if either an EIR or a Negative Declaration has been**

prepared.

_x_ 9. **Address where the EIR or Negative Declaration may be examined.**

_x_ 10. **If a determination was made that the project will have a significant effect on the environment, include in the NOD a statement of overriding consideration or a reference to where in the record the statement of overriding considerations is found. If the project will not have a significant effect, write "NA" next to the number 10 in this paragraph.** Refer to Sections 15091, 15092, and 15093 of Title 14 of the Natural Resources Code.

Other information needed for filing of NOD and payment of fees:

11. **Administrative Appeal Period**

Directions for Site Mitigation projects: Leave this item blank. It is not applicable to your project.

Directions for Permits: If there is no likelihood of an administrative permit appeal based on substantive comments received on the environmental concerns with the project, then **enter N/A**. If you enter a date here, the NOD will be held and will not be filed until after that date.

If there is a likely appeal, DTSC should not file the Notice of Determination until after the appeal is completed. Enter the end date of the window for the filing of permit appeals in such cases. This is normally 30 days after the permit was approved. The CEQA Tracking Center will contact you on that date regarding any appeals before filing the NOD. If an appeal has been filed and resolved, enter the date it was resolved below.

Directions for Regulations: Indicate the date that the Governor's Office of Administrative Law sent the regulation to the Secretary of State. If you are submitting this form before that date, leave the item blank. The CEQA Tracking Center will hold the NOD and will not file it until it receives word that the regulations were received by the Secretary of State.

Enter End Date of Administrative Appeal Filing Period if Applicable: _____

12. **Index Number** (from time sheet).

_____6430_____

13. **PCA number** (from time sheet).

_____22120_____

14. **Site number and WP** (from time sheet).

_____400307_____ __00_____

15. **Contact Information:**

Lead staff person_____Christine P. Brown_____

Telephone of lead staff person__714-484-5382_____

GROUPWISE ID, if any, of lead staff person___CBROWN___

Region of lead staff person____Cypress_____

Lead staff person's supervisor___Robert M. Senga_____

Supervisor's telephone___714-484-5315_____

Supervisor's GROUPWISE ID___RSENGA_____

Documents to send to the Planning and Environmental Analysis Section:

_X_ 16. **The signed original NOD, or the signed original NOD/Certificate of Fee exemption form.** The NOD must contain all the elements outlined in Numbers 1 through 10 above. If exemption from NOD filing fees is being sought, use the combined Notice of Determination/ Certificate of Fee Exemption form available from PEAS, instead of a standard NOD. Do not attempt to file a Certificate of Fee Exemption or Finding of De Minimis unless you have documented your analysis of De Minimis conditions in the Initial Study checklist and have consulted PEAS before the responsible agency and public review periods.

_X_ 17. **One copy of #16 above.**

_X_ 18. **One copy of the formal record declaring that the Department has approved the Negative Declaration or the Environmental Impact Report.** PEAS has a form which may be signed by a branch chief and used as the formal record.

_X_ 19. **One copy of the approved final version of the Negative Declaration and Initial Study, or the approved final version of the Environmental Impact Report.**

_X_ 20. **A Finding of De Minimis, if a Certificate of Fee Exemption is being filed.**

_X_ 21. **A copy of number 20 above.**

Revised by DTSC, PEAS 7/12/93
NODCL.FRM

Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Department of Toxic Substances Control

Edwin F Lowry, Director
5796 Corporate Avenue
Cypress, California 90630

Gray Davis
Governor

NOTICE OF DETERMINATION

Substitute of Form C

To: Office of Planning and Research
1400 Tenth Street
Sacramento, California 95814

From: Department of Toxic Substances Control
Geology and Corrective Action Branch
5796 Corporate Avenue
Cypress, California 90639

Project Title: Corrective Measures for Aerojet Ordnance - Chino Hills (EPA ID No. CAD981457302)

State Clearinghouse Number: SCH #99041052

Contact Person and Telephone: Christine P. Brown (714) 484-5382

Project Location: Chino Hills, California

Project Description: Approval of Corrective Measures for Corrective Action at the Aerojet Chino Hills Facility

Date project approved: October 17, 2000

This Notice of Determination is filed in compliance with Section 21108 of the Public Resources Code. The Department of Toxic Substances Control (DTSC), as lead agency, has approved the above described project and the attached Negative Declaration.

The DTSC has made the determination that the project will not have a significant effect on the environment.

The attached Negative Declaration was prepared for this project pursuant to the provisions of California Environmental Quality Act.

A copy of this Negative Declaration may be examined at the above address of the Department of Toxic Substances Control.

Original contains signature

Signature:_____ Date: 10/17/00

Branch Chief

Date received for filing at OPR:

Attachment

Department of Toxic Substances Control

Edwin F. Lowry, Director
5796 Corporate Avenue
Cypress, California 90630

Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Gray Davis
Governor

NEGATIVE DECLARATION APPROVAL

Project Title: Corrective Measures for Aerojet Ordnance - Chino Hills (EPA ID No. CAD981457302)

Clearinghouse Number: SCH #99041052

Contact Person and Telephone: Christine P. Brown (714) 484-5382

Project Location: End of Woodview Road, Chino Hills, California (San Bernardino County)

Project Description: Approval of Corrective Measures for Corrective Action at the Aerojet Chino Hills Facility.

The Department of Toxic Substances Control has found on the basis of the Initial Study and comments received on the Negative Declaration that there is no substantial evidence that this project will have a significant effect on the environment.

I hereby approve the Negative Declaration for this project.

Original contains signature

Signature:____ Date: 10/17/00

Karen Baker, CEG, CHG, Chief
Geology and Corrective Action Branch

NEGATIVE DECLARATION
for
Aerojet Ordnance - Chino Hills

Project Proponent:

Aerojet General Corporation
P.O. Box 13222
Sacramento, California 95813-6000

Contact: Christine P. Brown
California Department of Toxic Substances Control
4455 Corporate Avenue
Cypress, California 90630
(714) 484-5382

Project Description:

Aerojet General Corporation (Aerojet) is seeking approval of a plan to remediate soil at the Aerojet Ordnance - Chino Hills Facility (Facility) (EPA ID NO. CAD981457302) in Chino Hills, California. Aerojet is currently conducting Corrective Action under Section 25187 of the California Health & Safety Code at the Facility under the oversight of the California Department of Toxic Substances Control (DTSC).

Background:

Aerojet operated the Chino Hills Facility from 1954 through 1995 as a munitions assembly and test plant. The facility opened in 1954 as a small explosives research and development facility for Aerojet's Azusa, California plant. In 1965, with the closure of Aerojet's Riverside plant, operations increased at the Facility to include loading, assembling, and packing operations for several U.S. Government munitions systems. During the 1970's, the Facility developed and tested mostly explosives, propellants and primarily in the development and testing of high explosive incendiary (HEIs) a few proprietary organic chemicals. Since 1974, the Facility has been involved with projectiles, armor piercing incendiary (APIs) projectiles composed of depleted uranium (DU), target practice projectiles (TPs), and fuses. The Facility closed in December 1995.

The primary hazardous waste stream generated by development and testing activities consisted of explosives and propellants. Prior to 1965, these wastes were disposed of in a burn pit and a burn oven located in Solid Waste Management Unit (SWMU) #1 (See Figure 4 of the Initial Study). In 1965, Aerojet closed a neighboring facility in

Riverside and transferred the operations to the Chino Hills facility. Following the closure of the Riverside facility, increased production activities at the Facility generated larger quantities of explosive/propellant wastes. Thus, Aerojet constructed the Open Burn/Open Detonation(OB/OD) area for disposal of these increased quantities.

Other hazardous wastes generated and disposed of at the facility include wastewater from proprietary organic chemical testing. These wastes were disposed of in four ponds: two caustic ponds (SWMUs #6A & 6B), a Redwater pond (SWMU #7), and an HEI pond (SWMU #8).

As a result of site operations, soil in five areas of the site contains explosive chemicals, primarily RDX, soil in three areas of the site contains unexploded ordnance/ordnance fragments, and soil in two areas of the site contains CS (tear) gas containing material. See Table 1 of the Initial Study for locations. Cleanup levels for the explosive chemical contaminated soil were developed from a Health Risk Assessment, which is included as Appendix G of the Revised RFI Report (referenced as McLaren/Hart, 1999 in the Initial Study). The cleanup levels were based on residential standards, and are consistent with the proposed future recreational/residential development of the property.

Soil containing unexploded ordnance will be mechanically screened and visually inspected by trained ordnance personnel to ensure that all ordnance fragments are removed for the soil. Approximately 7850 yd^3 of soil will be screened. Soil containing explosive chemicals will be excavated and transported off site by tractor-trailer trucks to the nearest rail location, approximately 10 miles away. The soil will ultimately be sent to an appropriate treatment, storage and disposal facility.

Project Location:

The Aerojet Ordnance - Chino Hills facility is located at the end of Woodview Road in Chino Hills, California. The Facility itself is undeveloped, except for a limited number of buildings used for offices and the munitions assembly operations, and structures needed for the munitions test ranges. The Facility occupies approximately 800 acres; 400 is owned by Aerojet and the rest is leased to Aerojet. Aerojet uses the leased land primarily as a buffer zone between the Facility and the surrounding community. The leased land, as well as the land adjacent to the Facility is also used for cattle grazing. The nearest residential area is located approximately 0.75 miles northeast of the Facility. The Chino Hills State Park is located approximately 0.25 miles south of the Facility. No other residential areas, schools, nursing homes, hospitals, parks, playgrounds, etc. exist within 1 mile of the facility.

Findings of Significant Effect on Environment:

DTSC has determined that the project should not have a significant effect on the environment as that term is defined in the Public Resources Code, Section 21068. (A copy of the Initial Study which supports this finding is attached.)

Mitigation Measures:

DTSC has determined that the project does not require any additional mitigation measures beyond those incorporated as part of the project description.

Cal/EPA Department of Toxic Substances Control
Southern California Permitting Branch

CALIFORNIA ENVIRONMENTAL QUALITY ACT

INITIAL STUDY
For
Aerojet Ordnance Facility - Chino Hills

The Department of Toxic Substances Control (DTSC) has completed the following Initial Study for this project in accordance with the California Environmental Quality Act (§ 21000 et seq., California Public Resources Code) and implementing Guidelines (§ 15000 et seq , Title 14. California Code of Regulations).

I. PROJECT INFORMATION

Project Name: Proposed Remedial Measures/Notice of Decision for Corrective Action for Aerojet Ordnance - Chino Hills Facility (EPA ID NO. CAD981457302)

Site Location: The Aerojet Ordnance-Chino Hills Facility (Facility) is located at the end of Woodview Road (formerly Soquel Canyon Road) near the city of Chino Hills, San Bernardino County, California (See Figure 1 for a vicinity map) The Facility occupies approximately 800 acres; 400 acres are owned by the Aerojet General Corporation (Aerojet) and the rest is leased to Aerojet Aerojet uses the leased land primarily as a buffer zone between the Facility and the surrounding community. The leased land, as well as the land adjacent to the Facility, is also used for cattle grazing.

Contact Person/ Address/ Phone Number: Ms. Christine P. Brown
Department of Toxic Substances Control
1011 North Grandview Avenue
Glendale, California 91201
(818) 551-2174

Project Description:

Introduction

This project consists of remedial measures for ten areas on the facility that, as a result of the site investigation, which was conducted as part of RCRA Corrective Action requirements, were found to contain hazardous constituents above the human health-based cleanup levels established by a Health Risk Assessment The remedial measures consist of soil excavation and related activities This Initial Study will evaluate the impact of the remedial activities on human health and the environment, with particular emphasis on Earth, Air, Surface and Groundwater, Wildlife, Risk of Upset and Public Health

This project description will now describe background information, previous site investigations, and the present site investigation which lead to the proposed remedial measures. Remedial measures for each of the ten areas will be described, and the environmental analysis will be presented in the Environmental Setting/Impact Analysis section

Site Background

The site was vacant and used for cattle grazing until 1954 From 1954 to 1965, the Facility operated as a small explosive research and development facility for Aerojet's Azusa plant. In 1965, with the closure of Aerojet's Riverside facility, operations increased at the Facility to include loading, assembling, and packing operations for several U S Government munitions systems. During the 1970s, the Facility developed and tested mostly explosives, propellants and a few proprietary organic chemicals. Since 1974, the Facility has been involved primarily in the research, development, and testing of high explosive incendiary (HEIs) projectiles, armor piercing incendiary (APIs) projectiles composed of depleted uranium (DU), target practice projectiles (TPs), and fuses.

The primary waste stream generated by developing/testing activities throughout operation of the Facility consisted of explosives and propellants. From 1954 through 1965, approximately 50 to 1,000 lbs per year of explosive/propellant wastes were generated. At that time, these wastes were ignited in a burn pit and a burn oven located in Area 9 [Solid Waste Management Unit (SWMU) #1] Following the closure of the Riverside facility in 1965, increased production activities at the Facility generated larger quantities of explosive/propellant wastes Thus, Aerojet constructed the open burn/open detonation (OB/OD) area for disposal of increased quantities of explosive propellant wastes.

In addition to explosive and propellant wastes, the Facility generated small quantities of spent X-ray process chemicals, waste lubricating oil, and paint wastes Through the 1970s, proprietary organic chemicals were developed and tested at the Facility. The exact nature and structure of some of these chemicals are classified under confidential government contracts. These chemicals, however, are related to glycolate esters (Ditran), organophosphates, and o-ethyl-s-(2-diisopropyl aminoethyl) methylphosphonothiolate (VX) and included bis(2-chloroethyl) sulfide, "mustard," and o-chlorobenzylidene malononitrile (CS or "tear gas")

The waste chemicals generated from the testing of proprietary organic chemicals were treated in an aboveground tank and a below-ground mixing tank filled with a caustic solution (sodium hydroxide). This solution was held inside the mixing tanks for such a time until the chemical agents were neutralized Afterwards, the solution was drained into two ponds (SWMU #6) and allowed to evaporate Proprietary organic chemical testing was terminated in the late 1970s Proprietary organic chemical testing/treatment structures such as the chemical test chamber, mixing tanks, and greenhouses were removed in the late 1970's under a confidential government

contract. The aforementioned ponds were closed in 1979 and 1980 under the supervision of the Regional Water Quality Control Board (RWQCB). These ponds were subsequently investigated as part of the RCRA Facility Investigation (RFI), and one sample at 2.5 feet depth was found to contain di-n-butyl-phthalate at a concentration of 0.2 mg/kg, a concentration that does not pose a threat to human health and the environment

Previous Site Investigations and Remedial Activities

Initial remedial activities at the Facility began as early as 1979 with the closure of the chemical test structures and the 270,000- and 350,000-gallon Caustic Ponds (SWMUs #6A and #6B, respectively). Bioassay toxicity tests performed on soil and water samples collected from the ponds indicated that they were nontoxic. Thus, the RWQCB granted permission to close the ponds as nonhazardous. However, due to high salinity of the soils, the ponds were excavated and impacted soil was transported to a Class I disposal facility.

As part of the EPA's Priorities Initiation Program, Ecology and Environment, Inc. performed the Preliminary Assessment (PA) of the Aerojet Chino Hills Facility. Results of the PA were reported in the Ecology and Environment Inc. report dated May 6, 1992. The PA stated that there is no defined groundwater basin beneath the site. On-site wells tap groundwater in local fractures, but the water is nonpotable. In their report, significant corrective action considerations pertaining to the Facility were:

- Nearest municipal water supply well is 2.75 miles from the Facility and provides water for approximately 35,000 people;
- Surface water is not used for drinking within 3 miles of the Facility;
- There are no known sensitive environments within 3 miles of the Facility; and
- Access to the Facility is controlled by gate and by regular security patrols. The Facility is surrounded by a fence and an access buffer zone of open space, with the nearest resident approximately 0.75 mile from the Facility.

In addition to the Corrective Action project being addressed in this Initial Study, there have been two other recent site remediation projects conducted at the facility. The first project was the closure of the Open Burn/Open Detonation (OB/OD) Unit. This unit is being addressed under the Closure process pursuant to Chapter 14, Article 7 of Title 22 of the California Code of Regulations. The State of California has been authorized by the U.S. Environmental Protection Agency to implement its own hazardous waste regulations (Title 22) in lieu of the federal regulations pursuant to the Resource Conservation and Recovery Act (RCRA). The OB/OD unit, being active at the time the federal regulations went into effect, is thus regulated under Title 22 Article 7. The Closure process began in 1992 when Aerojet notified DTSC that Aerojet did not plan to seek a hazardous waste permit for this Unit. The Closure Plan for the OB/OD Unit was

approved in 1993 and field work began in Spring 1994. Soil was excavated from affected areas of the unit and screened to segregate metal fragments from soil. A limited amount of explosives-impacted soil was excavated and transported off site in October 1997. Aerojet now needs to submit the results of confirmation sampling to DTSC for review, and if the sampling demonstrates that all contaminated soil has been removed from the area, DTSC will certify the OB/OD Unit closed.

The other remediation project involved removal of depleted uranium projectiles from various areas at the site. Because Depleted Uranium (DU) is a low level radioactive waste, remediation of soil containing DU projectiles was overseen by the Radiologic Health Branch of the Department of Health Services, and is not under DTSC's jurisdiction. Remedial activities for DU-impacted areas at the Facility were described in the Rogers & Associates document entitled *D&D of Aerojet Chino Hills Facility, License No. 1459-36* dated February 13, 1996. The Radiologic Health Branch reviewed and approved the document on May 31, 1996. Remedial efforts began on July 8, 1996 and were completed in October 1997. Some areas of the Facility contain a mixture of explosives and DU wastes. Remediation of these areas requires consultants (McLaren/Hart, Inc. and Rogers & Associates) and contractors to coordinate remedial efforts to ensure that areas which contain a mixture of explosives and DU are adequately addressed for closure.

Present Site Investigation

The present site investigation involved characterization of 29 areas, called Solid Waste Management Units (SWMUs) or Areas of Investigation (AOCs), at the site that had been used for hazardous waste activities prior to enactment of RCRA but were no longer in operation at the time RCRA was enacted in 1981. See Figure 2, Facility Plot Plan, for locations of the SWMUs and AOCs. The present site investigation (also called RCRA Facility Investigation, or RFI) was performed under the Corrective Action process pursuant to Section 25187 of the California Health and Safety Code.

As part of the requirements for the RFI, sampling and analysis of soil, surface water and subsurface water was conducted to fully characterize the 16 SWMUs and 13 AOCs identified at the site. The sampling program was begun in June 1995 and was concluded in November of 1998. Hazardous waste constituents found in soil and which require remediation include lead, explosive chemicals (RDX, 1,3,5--trinitrobenzene), dioxins (found in trace amounts in two locations), and perchlorate. These constituents were not widespread; rather, they were limited to specific locations which contained at most one, two or three constituents above human health-based cleanup levels. Low levels of explosive chemicals (HMX and RDX) and perchlorate were found in surface water. At one location, the former Redwater Pond (SWMU #7), explosive chemicals (including HMX, RDX) were found in subsurface water. At another location, SWMU #15, Upper A-12 Test Area, perchlorate was found in subsurface water. RDX, HMX and

perchlorate were also found in surface water at several locations on the site. Results of the site investigation are found in the Revised RFI Report and the RFI Addendum Report.

Human and ecological risk impacts are presented in Section 7 of the Revised RFI Report and Chapters 2 and 3 of the RFI Addendum Report. Cleanup levels for explosive chemicals at SWMU #7, the former Redwater Pond, were established by a Health Risk Assessment included as Appendix G of the Revised RFI Report. Cumulative risk for the remaining areas of the site is addressed in Section 7. Both an ecological risk evaluation as well as a surface water risk evaluation for perchlorate and explosive chemicals are presented in the RFI Addendum Report. All contamination exceeding cleanup levels will be removed such that the site-wide carcinogenic risk will be less than 1×10^{-6} and the site-wide hazard index for a child will be less than 1.0 for a future residential land use scenario.

Two biological surveys were also conducted at the site to determine whether or not special-status plants and wildlife were present at the facility. The first survey was performed June 13-15, 1995 and is included as Appendix B of the Revised RFI Report. The second survey was performed on April 23, 1998 at the request of DTSC to look for additional special-status plants and wildlife not addressed by the first survey. This survey was submitted to DTSC in a letter dated June 8, 1998. The surveys report the presence at the facility of one special-status plant, the California Black Walnut, and sighting of several individuals of one special-status animal, the San Diego Horned Lizard. In addition, the facility was found to have low- to moderate potential to support the orange-throated whiptails and northern red diamond rattlesnakes. Remedial activities will not impact either of these species since no Black Walnut Trees are located near the ten SWMU #s/AOCs that require remediation and a qualified herpetologist will conduct preconstruction and construction monitoring for the three reptiles.

Summary of Remedial Measures

Ten of the 29 SWMUs and AOCs will require remedial measures. No remediation is planned for the remaining nineteen areas because the results of the Health Risk Assessment indicated that these areas were not significantly contaminated with hazardous substances or hazardous wastes that would pose a risk to human health or the environment. The SWMUs and AOCs requiring the proposed remedial measures are listed in Table 1. Further information regarding the SWMUs and AOCS can be found in the RFI Workplan, the RFI Workplan Amendment, the Revised RFI Report, the RFI Addendum Report, the Report on the Investigation of the Former Redwater Pond, and the Corrective Measures Workplan, copies of which are available in the information repository and at the DTSC office in Glendale.

Contamination requiring remediation at the facility falls into three categories. These are the following:

1. Soil containing ordnance fragments containing explosive material,
2. CS or "tear gas" canisters buried in the soil, and
3. Explosive-related chemicals in the soil

To remediate soil containing ordnance fragments (Category 1), the soil will be excavated and transported to Area 1C, where the soil will be processed in an automated mechanical segregation/screening plant to remove ordnance fragments This plant consists of a vibrating screen which sieves out fragments greater than 6" in diameter, a magnet which picks up metal debris between 1" and 6" in diameter, and a debris picking conveyer from which the soil can be inspected by trained personnel and ordnance can be picked by hand. Due to environmental hazards posed by transport of unexploded ordnance, such ordnance will be detonated on site at a designated location

To remediate soil with CS-containing material (Category 2), soil will be excavated and CS-containing material will either be removed manually or by a small, portable mechanical screening plant Soil will then be placed back in the original excavation.

To remediate soil containing explosive-related chemicals (category 3), soil will be excavated and transported off-site by truck and then rail car to a designated hazardous waste treatment storage and disposal facility.

Two other operations will be performed as a part of the proposed corrective measures; these are removal of buried culverts in AOCs #5 and #9 and grading of soil at two locations: SWMU #2, Landfill and Area 1C, the location of the mechanical screening operation. Soil in SWMU #2 and Area 1C will need to be graded due to the large quantity of soil that will either be excavated (landfill) or mechanically processed (mechanical screening plant located in Area 1C

The ten areas that require remedial measures are described in more detail below:

SWMU #1 (Former Burn Area "A"). This SWMU was a shallow, unlined 12' x 20' earthen pit, approximately 2' deep, that was used to burn explosive and propellant wastes. The soil in this unit is contaminated with dioxin and ordnance fragments. Approximately 6 cubic yards of soil will need to be excavated and transported off site due to dioxin contamination and approximately 3100 cubic yards of soil will need to be excavated and mechanically sifted to remove the fragments.

SWMU #2 (Landfill) This SWMU was a landfill measuring 120' x 400' and varying in thickness from approximately 1' to 10' The landfill reportedly contains assorted hardware,

building demolition materials, CS or "tear gas" ventilation filters, a small amount of lead contaminated soil (approximately 10 cubic yards), and a possible source of perchlorate. The entire landfill will be excavated and the hardware, building materials, CS filters, lead contaminated soil and possible perchlorate source will be removed and hauled off-site. The remaining uncontaminated soil will be placed back in the excavated area and the entire area regraded.

SWMU #7 (Redwater Pond) This SWMU is located in the north central portion of the facility and was used for the evaporation of wastewater generated from the cleaning of equipment used in the loading and packaging of explosives. The soil in this unit has been contaminated with explosive-related chemicals including RDX and 1,3,5-trinitrobenzene above cleanup levels. Approximately 3000 cubic yards of soil will need to be excavated and hauled off site. Subsurface water has been contaminated with explosive chemicals. Sume of this water will be pumped and removed as part of the Corrective Measures. Groundwater monitoring will be implemented as part of the Corrective Measures to confirm that any remaining contamination is not migrating.

SWMU #8 (HEI Pond). This SWMU is located next to the Redwater Pond in the north central portion of the facility and was used for the evaporation of wastewater generated from the cleaning of equipment used in the loading and packaging of explosives. The soil in this unit has been contaminated with RDX above cleanup levels. Approximately 400 cubic yards of soil will need to be excavated and hauled off site

SWMU #9 (Burn Area 18). This SWMU is located in the southern section of the facility and consists of a 12' x 20' pit approximately 2' deep that was used to burn explosive and propellant wastes and CS (tear gas). CS canisters have been found at this unit. The SWMU will need to be excavated to remove the canisters, and the canisters will be sent off site for disposal

SWMU #15. This SWMU consists of two subareas, the Upper A-12 Test Area and Test Area 15. SWMU #15 is located in the south central portion of the facility and was used for conducting explosive tests. The Upper A-12 Test Area was found to be contaminated with perchlorate in both soil and subsurface water. The soil was removed in November 1998 as part of the RFI investigation to avoid further migration of perchlorate to other areas of the site due to runoff from winter storms. Subsurface water at 42 feet has been found to be contaminated with perchlorate at 887 ug/l. This subsurface water appears to be localized; however, groundwater monitoring will be implemented as part of the Corrective Measures to confirm that the perchlorate contamination is not migrating. Test Area 15 contains ordnance fragments. Approximately 250 cubic yards of soil will need to be excavated and sifted to remove the fragments.

AOC #5 This AOC consists of three subareas, of which two: Test Range 16 and Test Area 17, are contaminated. This AOC is located in the central portion of the facility Test Range 16 contains ordnance fragments (approximately 1900 cubic yards of soil) and approximately 300 cubic yards of soil contaminated with RDX. The ordnance-containing soil will need to be excavated and sifted to remove the fragments and the RDX contaminated soil will be excavated and transported off site. Test Area 17 contains a buried culvert which will be excavated and removed from the area.

AOC #6 This AOC is the location of Test Range 1C, the site of the ordnance screening operation, and is located in the central portion of the facility Approximately 31,500 cubic yards of soil will need to be screened for ordnance. Once the screening operation is complete, the area will be regraded

AOC #7 (Test Range 7D). This AOC is located in the southeastern portion of the facility. Approximately 10 cubic yards of soil is contaminated with RDX and will be excavated and transported off site.

AOC #9 (Test Area 7B) This AOC is located in the southeast portion of the facility. The area contains two culverts and approximately 1 cubic yard of soil contaminated with RDX The culverts will be excavated and removed from the area and the RDX-contaminated soil will be excavated and transported off site

Further information regarding the remedial measures can be found in the Corrective Measures Workplan, copies of which are located at the DTSC office in Glendale and at the information repository in Chino Hills.

Agencies Having Jurisdiction Over the Project/ Types of Permits Required:

A permit under Rule 444 of the South Coast Air Quality Management District is required for detonation of unexploded ordnance and is currently on file with the City of Chino Hills Fire Department.

The volume of earth to be excavated during remediation may be such that a grading permit may be required by the City of Chino Hills Should this be the case, such a permit will be obtained

II. DISCRETIONARY APPROVAL ACTION BEING CONSIDERED BY DTSC

☐ Initial Permit Issuance	☐ Removal Action Plan
☐ Permit Renewal	☐ Removal Action Workplan
☐ Permit Modification	☐ Interim Removal
☐ Closure Plan	☒Other (Specify)
☐ Regulations	Remedy Selection/Notice of Decision

Program/ Region Approving Project: Facility Permitting Branch
Southern California Region

Contact Person/ Address/ Phone Number: Christine P. Brown
1011 N. Grandview Ave
Glendale, California 91201

III. ENVIRONMENTAL CONDITIONS POTENTIALLY AFFECTED

The boxes checked below identify environmental factors which were found in the following ENVIRONMENTAL SETTING/IMPACT ANALYSIS section to be potentially affected by this project, involving at least one impact that is "Potentially Significant" or "Potentially Significant Unless Mitigated".

☐ Earth	☐ Risk of Upset	☐ Aesthetics
☐ Air	☐ Transportation/ Circulation	☐ Cultural/ Paleontological Resource
☐ Surface and Groundwater	☐ Public Services	☐ Cumulative Effects
☐ Plant Life	☐ Energy	☐ Population
☐ Animal Life	☐ Utilities	☐ Housing
☐ Land Use	☐ Noise	☐ Recreation
☐ Natural Resources	☐ Public Health and Safety	

IV. ENVIRONMENTAL SETTING/ IMPACT ANALYSIS

The following pages provide a brief description of the physical environmental conditions which exist within the area affected by the proposed project and an analysis of whether or not those conditions will be potentially impacted by the proposed project. Preparation of the Environmental Setting and Impact Analysis sections follows guidance provided in DTSC's Workbook For Conducting Initial Studies Under the California Environmental Quality Act (CEQA) [Workbook]. A list of references used to support the following discussion and analysis are contained in Attachment A and are referenced within each section below

Mitigation measures which are made a part of the project (e g., permit condition) or which are required under a separate Mitigation Monitoring Plan which either avoid or reduce impacts to a level of insignificance are identified in the analysis within each section

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1 Earth (Workbook; page 11)

Description of Environmental Setting:

Topography: According to the U S. Geological Survey 7 5 Minute Topographic Map, Yorba Linda and Prado Dam Quadrangles, elevation at the Facility ranges from 1,025 to 1,331 feet above mean sea level. The topography of the Facility consists of moderately sloping, rolling terrain (i e , hills and canyons) within the Chino Hills, a subdivision of the large Puente Hills

Regional Geology: The Puente Hills are situated in the peninsular Range geomorphic province in Southern California (Department of Natural Resources, Division of Mines, Bulletin No 118, 1941) The Puente Hills is an uplifted structural block located between the active Chino and Whittier Faults. The possible earthquake hazards caused by the activity of these faults may include (DMG Open File Report 77-1, 1977):

1 Potential ground breakage along the faults from large earthquakes in the area
2 Landslides in foothills, especially in the upper plates of reverse faults where shaking is amplified.

A number of east-west trending and northwest-southeast trending cross faults have been mapped at the Aerojet Facility. Ten large anticlines are exposed in the hills between the Whittier and Chino faults; oil is produced from two of them including the Chino-Soquel Field located along the eastern boundary of the Facility.

Local Geologic and Hydrogeologic Setting: Outcrops occurring within the Facility include sedimentary deposits of the Soquel and Yorba members of the Puente Formation Each unit is described as follows:

The Soquel member, approximately 2000 feet in thickness, is the predominant sedimentary unit beneath the Facility It consists mostly of gray to light-brown, massive to well-bedded marine sandstone and interbedded light- to dark-gray or pale yellow-brown siltstone with minor conglomerate and shale (Durham and Yerkes, 1964). Permeability of the Soquel member is moderate in sandstone and low in siltstone or shale interbeds Porosity ranges from moderate to low in the sandstone, and is high in the siltstone interbeds. Use potential as a groundwater aquifer is fair to poor because of the low to moderate permeability (DMG open file report 84-24).

The Yorba member of the Puente Formation, approximately 2000 feet in thickness, consists of thin bedded white to brownish marine siltstone with lesser amounts of fine grained sandstone and shale (Durham and Yerkes, 1964). Permeability of the Yorba member is low, although joints may provide avenues for water penetration. Porosity ranges from high to moderate, yet the Yorba member's use as a groundwater aquifer is poor due to its low permeability (DMG open file report 84-24).

A thin veneer of recent alluvial deposits exists in the valleys The maximum thickness of the alluvial intervals is measured to be about 20 feet thick but is commonly only 2 to 3 feet thick

Ref: U S. Geological Survey 7.5 Minute Topography Map, Yorba Linda and Prado Dam Quadrangles
Department of Natural Resources, Division of Mines, Bulletin No. 118.
DMG Open File Report, 77-1, 1977.
DMG Open File Report, 84-24, 1984.
Durham and Yerkes, 1964

Analysis of Potential Impacts:

This project will require five earth moving operations. These are excavation and removal of buried culverts, soil excavation and removal of chemically contaminated soil, excavation and removal of CS-containing material, excavation and soil screening to remove ordnance from soil, and grading at two locations to restore the topography to its initial state. Several of the SWMUs/AOCs will require more than one operation. Remedial measures for the ten areas are described in Table 1.

Excavation and removal of chemically contaminated soil

Seven areas of the site (SWMU #1, SWMU #2, SWMU #7, SWMU #8, AOC #5, AOC #7 and AOC #9) will require excavation to remove chemically contaminated soil The former Redwater Pond (SWMU #7) has the largest contaminated soil volume (contaminant is RDX and 1,3,5-Trinitrobenzene), approximately 3000 cubic yards, with an excavation approximately 50' x 50' x 30' deep required The HEI Pond (SWMU #8) is contaminated with RDX and involves approximately 400 cubic yards of contaminated soil, with an excavation 100' x 20' x 5' required. Test Area 16 (AOC #5) is contaminated with RDX and involves approximately 300 cubic yards of contaminated soil, with an excavation approximately 30' x 30' x 10' required SWMU#1 is contaminated with dioxin and involves approximately 6 cubic yards of contaminated soil. SWMU #2 is contaminated with lead in one location and a possible perchlorate source. The lead contamination involves approximately 10 cubic yards of soil and the possible perchlorate source will be identified and remediated as excavation of the landfill proceeds AOC #7 is contaminated with RDX and involves approximately 10 cubic yards of soil AOC #9 is contaminated with RDX and involves approximately 1 cubic yard of soil Dust suppression measures including water will be used. All contaminated soil will be hauled by truck and then railcar to an appropriate treatment, storage and disposal facility

Excavation and removal of CS containing material

Two areas, SWMU #2 and SWMU #9 will require excavation to remove ventilation filters containing CS (SWMU #2) or CS (tear gas) canisters (SWMU #9). SWMU #2, Landfill, has dimensions of 120' x 20' x 10' deep and reportedly contains mostly building debris, with CS ventilation filters located within by electromagnetic survey. Aerojet plans to excavate the Landfill, remove the ventilation filters, remove metals above cleanup levels and locate and remove the suspected source of perchlorate. Noncrushable building debris (nonhazardous waste) will be removed and disposed of off site. Crushable debris and uncontaminated soil will be placed back in the Landfill The area will then be graded SWMU #9, Burn Area 18, was found to contain CS canisters while sampling was being conducted. The area measures 20' x 12' x 2' deep. Aerojet plans to excavate the area, remove the canisters, and replace the soil, as long as the soil is not otherwise contaminated

Excavation and removal of buried culverts

Two areas, AOCs #5 and #9 will be excavated to remove buried culverts Both excavations involve a very small amount of soil, approximately 10 cubic yards each.

After the excavations are completed, the excavation areas will be backfilled with clean soil. Compaction tests will be performed to ensure that ground contours will be stable once the project

is complete Confirmation sampling, if necessary, will take place to establish that all contaminated soil has been removed

Excavation and screening of soil to remove ordnance fragments

Three areas contain explosive-containing fragments or unexploded ordnance. These areas are SWMU #1, SWMU #15 (Test Area 15), AOC #5 (Test Range 16) The soil in these three areas will be excavated, transported to Area 1C and screened as described below to remove all suspected ordnance Recovered ordnance items will be inspected by trained specialists and, if unsafe or hazardous, will be transported to Test Area 16 for detonation See section on Risk of Upset for further details on the detonation. A total of 31,500 cubic yards of soil will be screened Some of this soil was excavated and transported to Area 1C as part of the remedial activities for depleted uranium (DU) with regulatory oversight provided by the California Department of Health Services Once the soil has been screened, it will not be transported off site but will be used as fill material since it is not otherwise contaminated.

Due to the number of areas scattered throughout the site which require excavation and sifting for removal of unexploded ordnance, one centralized area (Test Range 1C) will be utilized for soil screening. Area 1C is located in the central portion of the facility (See Figure 4). Area 1C was chosen as the site for soil screening due to its centralized location, large area of level ground available, lack of sensitive habitats, location in a box canyon away from other sensitive areas, easy control by an access and egress haul route, and the fact that a large percent of impacted soil exists within this area The large area of level ground available in Test Range 1C is ideal for construction and implementation of wind and water erosion control features.

Grading

Two areas, SWMU #2, Landfill, and Test Range 1C, soil screening area, will be graded once remediation activities are completed. The landfill, once the construction debris and CS-containing filters are removed, will be regraded using approximately 6000 cubic yards of soil, and grading of Test Range 1C will involve a similar volume of soil.

The excavation and grading activities will not have a significant impact on the environment because all excavated areas will be backfilled and graded, if needed, to restore the land to the approximate original surface condition.

Ref: McLaren/Hart, Corrective Measures Workplan, 1999.

Findings:

Potentially Significant Impact	*Potentially Significant Unless Mitigated*	*Less Than Significant Impact*	*No Impact*
☐	☐	☒	☐

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2. Air (Workbook; page 13)

Description of Environmental Setting:

Meteorology and Climatology: The San Bernardino County area climate is typically characterized as Mediterranean, with hot, dry summers and cool winters. Summer temperatures rise to 100° F or higher about 68 days per year and drop into the high 70s at night. During the winter, night time temperatures drop into the mid-40s or lower and rise into the 60s during the day. Temperature inversions are most frequent during the summer months with an average occurrence of 10 days or more per year (Jaykim, 1991)

Most of the local, annual precipitation occurs as rainfall from November through March According to data collected by the San Bernardino County Flood Control District, Department of Water Resources at the Chino Fire Station #2 meteorological station (located approximately 3 miles northeast of the Facility), the average seasonal precipitation (over the past 12 years) is approximately 13.90 inches per year with a maximum 1 year, 24-hour rainfall of 4.09 inches (measured on January 6, 1993)

Wind rose diagrams from the Ontario International Airport (located 11 miles northeast of the Facility) suggest a west-southwest prevailing wind direction. However, wind flow direction through the canyons and valleys at the Facility is variable. Wind velocity at the Facility reportedly is light in the summer and occasionally strong in the winter

Air Quality: According to the South Coast Air Quality Management District (SCAQMD), the Facility lies within the Southwest San Bernardino Valley air monitoring area. Station 33, which monitors air quality in this area of the valley, is located approximately 10 miles northeast of the Facility near the Ontario Airport Suspended particulate is the only pollutant (out of nine monitored by SCAQMD) commonly monitored at Station 33. The 1995 suspended particulate detected at the Ontario Monitoring Station 33 were reported as follows:

Suspended Particulate

Number of Days of Data:	61
Max Concentration in 24 hour period ($\mu g/m^3$):	167
Number of Samples (%) exceeding Standard	
Federal (>150 $\mu g/m^3$; 24 hour):	3 (4.9)
State (>50 $\mu g/m^3$; 24 hour):	31 (50.8)
Annual Arithmetic Mean Concentration (AAM) ($\mu g/m^3$):	54.0
Annual Geometric Mean Concentration (AGM) ($\mu g/m^3$):	44.2

The eight remaining pollutants (particulates, lead, sulfate, visual range, carbon monoxide, ozone, nitrogen dioxide, and sulfur dioxide) are monitored by other stations within the San Bernardino Valley at locations further away from the Facility. Of these, only the visual range and ozone were detected at levels which exceeded state and/or federal standards. Visual range exceeded state standards 51 days out of the 116 days measured. Ozone was detected at levels exceeding state and/or federal levels between 61 and 123 days out of 365 measured.

Ref: South Coast Air Quality Management District Station 33 monitoring data
Jakim Engineers, 1991
San Bernardino County Flood Control District

Analysis of Potential Impacts:

There are three types of soil excavation and two related activities, soil screening and grading, that will be implemented at the site and have potential air impacts. These activities are as follows:

1) Excavation and removal of below-ground culverts from AOC #5 and AOC #9.

2) Excavation and mechanical screening of soil to remove ordnance fragments. This operation applies to SWMU #1, SWMU #15 (Test Area 15), AOC #5 (Test Range 16)

3) Excavation and off site disposal of chemically impacted soil. This operation applies to SWMU #1, SWMU #2, SWMU #7, SWMU #8, SWMU #15, AOC #5, AOC #7, and AOC #9

4) Excavation of soil and segregation of CS-containing material. This operation applies to SWMU #2 and SWMU #9.

5) Grading of soil at SWMU #2 and Area 1C.

In addition, approximately ten private vehicle (passenger car) trips/day for 24 weeks (life of project) will be required to transport personnel to and from the site.

To estimate whether or not these operations will be significant from an air quality point of view, emissions in lb/day from the above operations will be calculated for reactive organic gases (ROG), carbon monoxide (CO), nitrogen oxides (NO_x), and PM_{10}, and compared to South Coast Air Quality Management District thresholds of significance taken from the CEQA Air Quality Handbook. The thresholds are as follows: 55 pounds per day of reactive organic gases (ROG).

55 pounds per day of nitrogen oxides (NO_x), 550 pounds per day of carbon monoxide (CO) and 150 pounds per day of particulates (PM_{10})

Emissions calculations are based on formulas from Chapter 9 of the CEQA Air Quality Handbook, emissions factors for autos and dirt-hauling tractor-trailer trucks from database EMFAC7G, year 1998, and emissions factors for off-road equipment from the Emission Inventory Procedural Manual. The calculations are included as Attachment 1 to this Initial Study and a summary of the calculations is presented below.

Summary

The following table summarizes the emissions of reactive organic gases, carbon monoxide, nitrogen oxides and PM_{10} fro the 5 remedial activities:

Activity (Duration)	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	PM_{10} (lb/day)
removal of culverts (6 days)	145.85	43.3	164.7	9.2
excavation, mechanical screening of soil (11 weeks)*	12.06	36.1	126.87	35.0
excavation, off site disposal of soil (3 weeks)	2.07	11.32	11.9	29.2
excavation, segregation of CS-containing material (1 week)	5.75	15.5	60.6	30.1
Grading of soil (4 days)	16.58	47.35	192.4	94.7
Passenger automobiles (6 months)	0.27	4.55	0.49	0.01

*Time-weighted average

Total emissions of ROG, CO, NO_x and PM_{10} are summarized in the above table. The emissions for the excavation and mechanical screening activity were calculated as time-weighted averages because this activity will use multiple vehicles (ten total) for different durations (1 week to 11 weeks). See Attachment 1 to this Initial Study for the calculations. Two of the activities (excavation/mechanical screening of soil and excavation, off-site disposal of soil) may occur at the same time. The emissions of ROG, CO, and PM_{10} are well below the thresholds of significance (55 lb/day ROG, 550 lb/day CO and 150 lb/day PM_{10} established by SCAQMD NO_x emissions for four of the activities (removal of culverts, excavation/mechanical screening of soil, excavation and segregation of CS-containing material, and grading of soil) exceed the

threshold of significance for NO_x. However, these activities are of limited duration (three activities are of one week or less duration and one activity is of 11 weeks duration) and DTSC believes that this short duration renders the impact to the environment from NO_x emissions less than significant.

Ref: CEQA Air Quality Handbook
McLaren/Hart Revised RFI Report, Corrective Measures Workplan, 1999
EMFAC7G Database for 1998
Emissions Inventory Procedural Manual

Findings:

Potentially Significant Impact	*Potentially Significant Unless Mitigated*	*Less Than Significant Impact*	*No Impact*
☐	☐	☒	☐

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3 Surface and Ground Water (Workbook; page 17)

Description of Environmental Setting:

Surface Water: Rainfall runoff from the central or southern portion of the Facility (covering approximately 80% of the Facility) drains toward the west into Soquel Canyon Surface water runoff within Soquel Canyon accumulates in Lake Aerohead Lake Aerohead, located within the Facility, is used for the detention of rainwater runoff only and is commonly dry An intermittent stream flows through the canyon toward the west for approximately 5 miles before entering a reservoir behind Carbon Canyon Dam

Rainfall runoff from the northern portion of the Facility (covering approximately 20% of the Facility) drains toward the northeast into an unnamed canyon An ephemeral creek within this unnamed canyon flows northeast for approximately 4 miles where it drains into Lake Los Serranos, a privately owned lake used for runoff control Overflow from Lake Los Serranos flows another 2 miles where it drains into the Prado Dam Flood Control Basin

Several year-round springs are located outside the Facility boundaries The nearest is approximately 0 5 miles northeast of the McDermont Ranch Several seasonal water seepages/springs are located within the Facility These seepages commonly dry out during the summer months

Regional Groundwater: The Puente Hills are characterized as non water-bearing sedimentary rocks There is no defined water table beneath the hills, but localized groundwater occurs in subsurface fractures All water sources within the Facility are non-potable Drilling logs and files reviewed at the Department of Oil and Gas (DOG) located in Long Beach, California indicate groundwater was detected in 8 of the 32 oil wells located in the Chino-Soquel field at depths ranging from 300 to 882 feet These extreme variations in depth to base of fresh water, as well as oil occurring only within a very tight area, suggest that sharp folds or fault dissection(s) within the geologic units control both oil and deep groundwater migration Logs from the remaining wells do not report encountering any groundwater

As stated in the Department of Water Resources (DWR) Bulletin No 104-3 entitled *Meeting Water Demands in the Chino-Riverside Area, Appendix A Water Supply*, "The Chino Fault zone passes through bedrock exposures along the flanks of the Chino and Puente Hills Since the Puente Hills are neither permeable nor contain any significant amount of groundwater, the effect of the Chino Fault on the migration of groundwater into the watershed is not significant." It was also noted in the bulletin that "the strata (Miocene rocks), where they are accessible to drilling, lack the permeability and water quality required of water bearing formations."

According to information gathered from the county geologist of San Bernardino County Waterworks District and the County Department of Environmental Services, the Chino Hills geology is complex and there is no defined water table beneath the hills Only localized water occurs in the subsurface DWR Bulletin No 118 (1975), entitled *California's Ground Water,* did not identify underground basin or water storage underneath the Chino Hills in their hydrologic study of the southern portion of the state

Local Groundwater: According to records of the San Bernardino County Waterworks District, there are no formal groundwater monitoring wells in the area Four water wells were installed on or near the Facility to supply non-potable water One off-site well currently supplies all of the Facilities non-potable water Two water wells on the Facility are operating at this time (one well is being used for cattle watering and the other is idle, but can be activated to provide backup fire protection water) The fourth well is dry A fifth on-site well originally installed as an oil well still operates and is used by local ranchers for cattle watering; however, Aerojet representatives do not have access to this well The groundwater depth reported in all five wells ranged from 120 feet to 800 feet

Ref: Department of Oil and Gas (DOG)
DWR, Bulletin No 104-3 and Bulletin No 118
San Bernardino County Department of Environmental Services
San Bernardino County Waterworks District

Analysis of Potential Impacts:

This project will not significantly affect or alter any surface water body, riparian habitat, or groundwater The bedrock underlying the facility is sedimentary rock with low permeability characteristics The strata comprising the bedrock are generally thin and discontinuous and are approximately 0 5 to 20 feet thick These bedrock characteristics cause the majority of the precipitation occurring at the facility to drain away as surface water runoff rather than infiltrating into the bedrock

Contamination of subsurface water with explosive chemicals and perchlorate has occurred at two areas of the facility The first, SWMU #7 (Former Redwater Pond), is an area that was used for dumping contaminated rinse water from the cleaning of building areas used to assemble and pack munitions with explosives To determine if migration of explosive chemicals into groundwater had occurred, the facility drilled one boring to approximately 60 feet below ground surface (bgs) Water bearing zones (groundwater) were encountered at two depths, the first at approximately 40 feet bgs and the second at approximately 60 feet bgs The two zones were separated by a layer of shale approximately 20 feet thick Groundwater in the upper zone was contaminated with RDX and HMX at concentrations of approximately 4,200 ug/L and 320 ug/L Lower concentrations (< 15 ug/L) of 1,3,5-trinitrobenzene, 1,3-dinitrobenzene, 4-amino-2,6-dinotrotoluene and 2-amino-

4,6-dinitrotoluene were also detected. Groundwater in the lower zone was also contaminated with RDX at a concentration of approximately 200 ug/L. Two monitoring wells were installed down gradient of SWMU #7 and neither well showed the presence of the upper water bearing zone. The lower zone, which was encountered at approximately 85 feet bgs, showed no contamination, indicating that no contaminant migration occurred.

At the present time, migration of the contamination into groundwater off-site that potentially could be used for drinking is not likely. However, remedial activities at SWMU #7 (soil excavation down to 40 feet, the level of the first water bearing zone) could cause migration. Therefore, DTSC is requiring the facility to conduct groundwater monitoring at the two monitoring wells at three month intervals through one seasonal cycle (rainy and dry seasons) following remedial activities to demonstrate/rule out migration. If migration occurs, the need for remediation of groundwater will be re-evaluated.

In the second area, SWMU #15, Upper A-12 Test Area, a perchlorate level of 877 ug/L has been found in localized subsurface water at a depth of 42 feet. Groundwater monitoring will be implemented as part of the Corrective Measures to confirm that the perchlorate contamination is not migrating.

Sampling of surface water at several locations at the facility revealed low concentrations of explosive chemicals (RDX and HMX) and low concentrations of perchlorate. Health risk and ecological evaluation of the explosive chemical concentrations concluded that these low concentrations do not pose a threat to human health and the environment, except for surface water down gradient of SWMU #2, Landfill. The Landfill (SWMU #2) is believed to contain a source of perchlorate (resulting in perchlorate concentration of 50 ug/L) in an intermittent creek (dry in summer) bordering the east side of the Landfill. Since the Landfill will be excavated as part of the site remediation activities and the perchlorate source removed, the perchlorate levels should be reduced to levels posing no human health or ecological impact. Confirmation sampling will be performed to verify this.

Remedial measures will take place in Test Range 1C, which is located in the central portion of the facility (See Figure 4). This area was selected since it is located away from surface water bodies and/or stream courses. The large amount of level, graded surface area available at Test Range 1C will facilitate construction of storm-water runoff controls and greatly reduce any potential impact to water sources due to storm or flood conditions. The only area identified at the Facility in which excavation activities may impact a water course is the Landfill (SWUM #2). The landfill rests above the flood plain of the intermittent Soquel Canyon Creek and currently forms a partial embankment of the creek. Excavation of the embankment may release material into the creek. To reduce this threat, extra precautions will be implemented during excavation which may include, among others, construction of silt fences and implementation of flood-

control measures. Excavation activities will coincide with the dry season when the creek bed is commonly dry.

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, and Corrective Measures Workplan, 1999

Findings:

Potentially Significant Impact	*Potentially Significant Unless Mitigated*	*Less Than Significant Impact*	*No Impact*
☐	☐	☒	☐

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4 Plant Life (Workbook; page 20)

Description of Environmental Setting:

A biological survey was performed at the Facility by Jones & Stokes Associates in June 1995, and an additional survey was performed in April 1998. A study of botanical, sensitive habitats, and special-status wildlife species was conducted as part of these surveys. The results of the surveys indicated that overall disturbances, fragmentation, and heavy grazing at the site reduce its potential to support populations of special-status plants. Few native annual and perennial herbs were observed.

The project site contains mature coast live oak woodlands in many of the drainages and on north-facing slopes. Black sage (*Salvia mellifera*) grows in the upper portions of the drainages, and grasslands dominate most other slopes.

Habitats surrounding the Facility are variable. In the east, rolling hills supporting non-native grasslands predominate. In the south and west, extensive oak woodlands and black sage habitats are contiguous with similar habitats onsite; oak woodlands and black sage also occur north of the site, but not as extensively as in the south and west.

Numerous roads, dirt trails, and structures are present onsite. These artificial features have resulted in extensive areas of disturbed habitat surrounded by dirt roads. Cattle grazing has also greatly altered native vegetation onsite, especially the understory grasslands and browse plants.

Several sensitive plant habitats occur at the Facility. These include: 1) Southern Coast Live Oak Riparian Woodlands (CLOW), 2) California Walnut Woodlands, 3) Southern Mixed Chaparral/Coastal Sage Scrub, and 4) Riparian Scrub or Mulefat Scrub

Ref: 1. Jones & Stokes Associates, March 1996.
2. Jones & Stokes Associates, June 1998.
3. Natural Diversity Data Base
Natural Heritage Division
Department of Fish and Game

Analysis of Potential Impacts:

This project does not involve nor result in any significant change to any plant life nor any plant habitat. The biological surveys conducted by Jones and Stokes identified black walnuts as the only special-status wildlife species on the Facility. The occurrence of black walnuts

communities is limited to stream beds and deep canyons on the Facility. No planned closure activities will be conducted in or near this special-status community.

The SWMUs identified for excavation at the facility, with the exception of the landfill, are not near and do not contain native or sensitive habitats and thus (other than the landfill) no measures will be needed to reduce impact. A mulefat scrub riparian area borders one side of the landfill. If mulefat is required to be cleared as part of the remedial activities, the affected vegetation will be cut into chips and replanted into the soil to restore the native vegetation.

Areas identified for excavation which are not subject to future development plans will be restored to their natural condition and replanted with native grasses and/or shrubs.

Ref: Jones & Stokes Associates, March 1996.
Jones & Stokes Associates, June 1998

Findings:

Potentially Significant Impact	*Potentially Significant Unless Mitigated*	*Less Than Significant Impact*	*No Impact*
☐	☐	☒	☐

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5 Animal Life (Workbook; page 22)

Description of Environmental Setting:

A biological survey was performed at the Facility by Jones & Stokes Associates in June 1995 and an additional survey was performed in April 1998. A study of botanical, sensitive habitats, and special-status wildlife species was conducted as part of these surveys. The reports indicated that overall disturbances, fragmentation, and heavy grazing at the site reduce its potential to support populations of special-status plants. No evidence of special-status rodents or birds was observed.

A number of habitats with the potential to support sensitive wildlife occur at the facility. These are coastal sage scrub, grasslands, chaparral, hardwood woodlands, riparian areas and desert habitats.

Ref: 1. Jones & Stokes Associates, March 1996.
2. Jones & Stokes, June 1998.
2. Natural Diversity Data Base
Natural Heritage Division
Department of Fish and Game

Analysis of Potential Impacts:

This project does not involve nor result in any significant change to any animal life or animal habitat. The biological survey conducted by Jones and Stokes in June 1995 identified the San Diego horned lizard as the only special-status wildlife species on the Facility. Two individuals were found on a hilltop southeast of Soquel Canyon.

No special-status animal species were observed during the 1998 field survey. The facility has low- to moderate potential to support orange-throated whiptails (a lizard) and northern red diamond rattlesnakes. Although these species were not observed during the June 1995 and April 1998 surveys, they could occur in low numbers in or along woodland or scrub habitats, especially chaparral and coastal sage scrub habitats, grasslands and disturbed areas. Red-diamond rattlesnakes are usually found in rocky areas or piles of human debris. No suitable rocky areas or debris piles were found near the SWMUs or AOCs.

Both the southwestern pond turtle and Southern California arroyo chub (a fish) have low potential to occur in riparian areas during the wet season, which occurs from approximately October through March.

To avoid or minimize potential impacts on these species, a qualified herpetologist will conduct preconstruction and monitoring during construction surveys for these species If they are present in the affected area, the animals should be relocated to a safe area near the affected area. The relocation of these reptiles may need approval from the California Department of Fish and Game.

Low concentrations of explosive chemicals (RDX, HMX and perchlorate) were detected in surface water Health risk data provided by the facility and reviewed by DTSC indicated that these concentrations would not pose a health threat to any wildlife

Ref: Jones & Stokes Associates, March 1996.
Jones & Stokes Associates, June 1998

Findings:

Potentially Significant Impact	*Potentially Significant Unless Mitigated*	*Less Than Significant Impact*	*No Impact*
☐	☐	☒	☐

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6. Land Use (Workbook; page 24)

Description of Environmental Setting:

The site is located near the city of Chino Hills with a large buffer zone separating it from any surrounding community and industry. The nearest residential development is located 0 75 miles north of the Facility Areas extending several miles south, east, and west of the Facility are undeveloped grazing lands and the Chino Hills State Park Property within the buffer zone and the Facility is used primarily for cattle grazing. Of the 800 acres which comprise the Facility, testing and manufacturing activities were conducted on less than 10%. With the exception of numerous firebreak roads, the majority of the property is undeveloped

The majority of the manufacturing/assembly buildings are located in the northern portion of the Facility near the main gate This area consists predominantly of open range. Most of the ordnance testing activities took place in the central and southern portions of the property in both open range and wooded areas. Currently, the administration building is the only fully functional building on site The manufacturing/assembly buildings are inoperable and most are void of equipment and fixtures.

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan, 1999.

Analysis of Potential Impacts:

This project does not involve, address, or result in alteration of present or planned land use. The site is located near the city of Chino Hills with a large buffer zone that separates it from any surrounding community or industry. Property within the buffer zone and the Facility is used primarily for cattle grazing, but is zoned for residential.

The proposed closure project will be conducted within the portion of the property formerly used for manufacturing and testing of ordnance, and will involve the excavation of SWMUs/AOCs currently not in use Closure documentation will include detailed procedures for the removal of debris and remnant of ordnance from the SWMUs and AOCs to safeguard the property for future residential and recreational land use.

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan, 1999

Findings:

Potentially Significant Impact	*Potentially Significant Unless Mitigated*	*Less Than Significant Impact*	*No Impact*
☐	☐	☐	☒

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7 Natural Resources (Workbook; page 25)

Description of Environmental Setting:

The Chino-Soquel Oil Field is located on a small anticline located adjacent to the northeastern border of the Facility. It occupies a triangular area of approximately 35 acres. Of the 32 oil wells completed in this Field, only 9 wells produced oil. The maximum production of 70 barrels of oil per day was reached in 1951 (Durham and Yerkes, 1964). Two-thirds of the oil wells in this Field have been suspended or abandoned. Currently, the Field produces approximately 10 to 12 barrels of oil per day.

Ref: Durham and Yerkes, 1964

Analysis of Potential Impacts:

This project does not involve, address, or result in change of the use of any natural resource. Water used for dust control will be supplied by a truck from offsite sources. Minimal usage of gasoline, diesel, and possibly natural gas will occur for the planned 2 to 6 months of excavation and remediation activities. Furthermore, the location of these activities will not interfere with current oil production or cattle grazing.

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan, 1999

Findings:

Potentially Significant Impact	*Potentially Significant Unless Mitigated*	*Less Than Significant Impact*	*No Impact*
☐	☐	☐	☒

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8 Risk of Upset (Workbook; page 26)

Description of Environmental Setting:

Explosives, by nature, present a potential risk of upset by unintentional and unexpected detonation. The primary risk of upset potential during closure activities is the detonation of fired HEIs in the target areas during excavation. A certain amount of the HEIs may not have been exploded.

The possibility of a traffic accident occurring during the transport of soil contaminated with explosive chemicals will also be discussed.

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan 1999.

Analysis of Potential Impacts:

Detonation

All ordnance fragments recovered from the soil screening operation will be examined by trained ordnance specialists to determine if detonation is required to render the fragment safe. If the ordnance specialist determines that detonation is required, the specialist will then perform an evaluation to determine whether or not the fragment can be safely transported off site to an appropriate treatment, storage or disposal facilityl If the specialist determines that the ordnance fragment is too unstable for off-site transport, the fragment will be detonated on site. DTSC authorization will be obtained at that time if on site detonation is determined to be necessary.

If on-site detonation becomes necessary, unexploded ordnance fragments (UXO) will be detonated at a specific site on the facility, with a charge size of approximately 10 pounds. The site specific Health and Safety Plan, which includes instructions on clearance, excavation, and demilitarization of unexploded ordnance, will be observed at all times. At the conclusion of field activity for the project, the detonation area, if used, will be sampled for explosives and any soil contaminated above soil cleanup levels will be excavated and hauled off site. In case of an emergency which requires assistance from local authorities (such as the fire or sheriff's department), Aerojet has established close relationships with these entities and presented on-site seminars and explosive demonstrations so that they are prepared for such an emergency. Given that the facility is located 0.75 miles from the nearest residence, the size of the charge involved, and the fact that the area will be sampled and remediated, if necessary, DTSC concludes that no impact will occur to the environment or surrounding community.

Traffic Accident

As stated above, the possibility of a tractor-trailer truck accident exists, and, if such an accident were to occur, the land/sea container could rupture and expose humans and the environment to RDX contaminated soil. The possibility of such an accident happening in remote, given the distance the trucks would travel (10 miles) and the number of trucks involved (300). The possibility that the container would rupture as a result of the accident is also remote, given the rugged construction of these containers. Based on the levels of explosives that would be present in the transported soil (80-150 mg/kg RDX and <29 mg/kg 1,3,5-trinitrobenzene) and known health effects of these chemicals, short term exposure of the public to this contaminated soil will not pose a health threat.

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan 1999
Rhyne, W.R (1994)
Yinon, 1990

Findings:

Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
☐	☐	☐	☒

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9 Transportation/Circulation (Workbook; page 29)

Description of Environmental Setting:

The only public access and egress route to the Facility is provided by Woodview Road With the exception of an occasional rancher, Aerojet employees and subcontractors are the only regular vehicular traffic on the road Entrance into the Facility is controlled by gate and security guards.

Unlimited parking and storage areas are available on the facility; thus, once heavy equipment is mobilized to the site, it will remain on-site until activities are complete

As stated in the section on Risk of Upset, the possibility of a traffic accident involving a tractor-trailer truck carrying contaminated soil exists, although the possibility is remote Please see the Risk of Upset section for a discussion of this possibility.

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan 1999.

Analysis of Potential Impacts:

This project does not present a significant change of transportation or circulation because no major transportation equipment will be required. Closure activities will not impact local traffic patterns, parking, transportation systems or alter in any way waterborne, rail or air traffic. Nor will they increase traffic hazards to motor vehicles, bicyclists or pedestrians.

It is anticipated that no hazardous wastes will be transported off-site with the exception of CS canisters. CS canisters or "tear gas" will be excavated, packaged, placarded, manifested and transported off-site to an approved disposal facility. Transportation will be conducted in accordance with federal, state, and local regulations governing the transport of hazardous wastes

The impacts to traffic activity resulting from this proposed project will be truck traffic, car trips and the transportation of some earth moving equipment (excavator, backhoe, 2 dump trucks, bulldozer, front-loader) to and from the Facility. An estimated twenty trucks per day for 16 days (308 trucks total) will be needed to transport contaminated soil off site to the nearest rail location. Unlimited parking and storage areas are available on the Facility; thus, once heavy equipment is mobilized to the site, it will remain on-site until activities are complete. Five to ten cars will be required to transport personnel on the site daily to conduct the site remediation activities DTSC believes that the low traffic volumes and short duration of the project (2 weeks

for truck trips, 2-6 months for the entire project) result in a less than significant impact to transportation/circulation

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan 1999.

Findings:

Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
☐	☐	☒	☐

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10 Public Services (Workbook; page 31)

Description of Environmental Setting:

Closure activities will be conducted by the facility employees or Aerojet's contractors with oversight of DTSC Closure activities should not require assistance from local government or city authorities, except in case of an emergency as described in the Risk of Upset section The remediation should be completed in 2 to 6 months

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan 1999

Analysis of Potential Impacts:

Closure activities will not increase the need for fire or police protection since the Facility has its own security service and fire truck Activities will not impact schools, parks or recreational facilities, public facilities, and other government services

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan 1999

Findings:

Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
☐	☐	☐	☒

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11. Energy (Workbook; page 32)

Description of Environmental Setting:

The site (formerly an ordnance assembly and test facility) is closed and uses minimal energy resources (electricity, water) for maintenance of one building.

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan 1999.

Analysis of Potential Impacts:

This project will not result in a significant change in the demand for fuel or energy. The number of heavy equipment vehicles involved (9) is small, the number of trucks to haul contaminated soil (308 total) is small and will not significantly impact fuel resources. Power needed for the project will be supplied by a diesel-fuel power generator run for 1-2 months; the amount of fuel used by this generator is approximately 30 gallons/day and will not significantly impact fuel resources.

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan 1999

Findings:

Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
☐	☐	☐	☒

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12. Utilities (Workbook; page 32)

Description of Environmental Setting:

Although the Facility ceased operations in November 1995, all on-site utilities are operational and available for closure activities. This includes water, sewer, electrical, and telephone services.

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan 1999

Analysis of Potential Impacts:

This project will not require an increase or expansion of already existing utility systems

Ref: Revised McLaren/Hart RFI Report, RFI Addendum Report, Corrective Measures Workplan 1999.

Findings:

Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
☐	☐	☐	☒

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13. Noise (Workbook; page 32)

Description of Environmental Setting:

The City of Chino Hills has established noise performance standards which are, for the most part, compatible with those of CAL-OSHA. The City's performance standards for noise are listed in Chapter 7 of the City's General Plan and in Chapter 9.90.020 of the Development Code. Table N-1 in Chapter 7 of the General Plan defines citywide acceptable and unacceptable noise levels based on land use. These standards apply to noise levels as measured on other properties. The Facility has been designated by the City as open space/agricultural land.

Ref: City of Chino Hills General Plan and Development Code

Analysis of Potential Impacts:

Noise may be generated as a result of project activities that require use of off-road vehicles. The nearest residential development or industry is located approximately 0.75 miles away and thus will not be impacted by noise from the operation of such equipment.

Operation of off-road vehicles such as bulldozers or backhoes may generate excess noise for workers working in the vicinity of this equipment. The Health and Safety Plan developed for the RFI contains provisions for protecting on-site workers from excess noise, and has established an action level of 85 decibels. Workers are required to use hearing protection such as ear muffs or ear plugs if noise levels exceed this action level. Hearing protection will have a Noise Reduction Rating of at least 20 decibels.

Ref: Health & Safety Plan developed for RFI (McLaren/Hart RFI Workplan, 1995)

Findings:

Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
☐	☐	☐	☒

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14 Public Health and Safety (Workbook; page 34)

Description of Environmental Setting:

The following project activities will be evaluated for potential impact or described in this section:

1. Health Risk Assessment establishing clean-up levels for soil
2. Excavation and Screening of Soil for Ordnance Fragments
3. Excavation and removal of Culverts from Soil
4. Grading
5. Transportation off-site of soil contaminated with explosive chemicals
6. Transportation off-site of CS-containing items
7. Detonation of ordnance fragments

Health Risk Assessment

Human and ecological risk impacts are presented in Section 7 of the RFI Report and Chapters 2 and 3 of the RFI Addendum Report. Cleanup levels for explosive chemicals at SWMU #7, the former Redwater Pond, were established by a Health Risk Assessment included as Appendix G of the RFI Report. Cumulative risk for the remaining areas of the site is addressed in Section 7 Both an ecological risk evaluation and the surface water risk evaluation for perchlorate and explosive chemicals are presented in the RFI Addendum Report All contamination exceeding cleanup levels will be removed such that the site-wide carcinogenic risk will be less than 1×10^{-6} and the site-wide hazard index for a child will be less than 1.0 for a future residential land use scenario.

Hazardous waste constituents found in soil and which require remediation include lead, explosive chemicals, including RDX and 1,3,5-trinitribenzene, dioxins (found in trace amounts in two locations) and perchlorate Only one of the locations containing dioxin, SWMU #1, will require remediation. Dioxin at the other location, SWMU #9, does not require remediation because the level of cancer risk at this location was calculated to be less than 1×10^{-6}. These constituents were not widespread; rather, they were limited to specific locations which contained at most one, two or three constituents above the cleanup levels. Low levels of explosive chemicals (HMX and RDX) and perchlorate were found in surface water, although the health risk assessment demonstrated that these concentrations did not pose a risk to human health or wildlife. At one location, the former Redwater Pond (SWMU #7), explosive chemicals including HMX, RDX and TNT, were found in subsurface water at 35 feet below ground surface. This water will be remediated as part of the remedial activities planned for SWMU #7

Excavation and Screening of Soil for Ordnance Fragments

Five areas contain ordnance fragments These areas are SWMU #1, SWMU #15 (Test Area 15), and AOC #5 (Test Range 16). The details of the screening operation are described in the section on Earth and are described in more detail in the Corrective Measures Workplan

Excavation and removal of Culverts from soil

Two areas, AOC #5 and AOC #9, will be excavated to remove buried culverts The details of this operation are described in the section on Earth and are described in more detail in the Corrective Measures Workplan.

Grading

Two areas, SWMU #2 (Landfill) and Area 1C will be graded once remediation activities are completed.

Soil Contaminated with Explosive Chemicals

During the RFI sampling, soil in several areas on the Facility was identified to contain levels of explosive chemicals which exceeded the established cleanup levels. SWMU #7 contains RDX and 1,3,5-trinitrobenzene above cleanup levels. Other areas, SWMU #8, AOC #5, AOC #7, and AOC #9, contain RDX above cleanup levels. SWMU #1 contains approximately 6 cubic yards of soil contaminated with dioxin. SWMU #2 contains approximately 10 cubic yards of soil contaminated with lead and a possible perchlorate source All contaminated soil will be excavated and transported off-site as part of the proposed remedial measures

Excavation and removal of (CS) or Tear Gas Canisters

CS-containing material was found in two areas of the site. SWMU #2, Landfill, reportedly contains buried ventilation filters with CS in the filter elements and SWMU #9 contains CS canisters. CS canisters do not contain an explosive charge. Although CS or "tear gas" is non-lethal, exposure will cause the eyes to burn, tear copiously, and involuntarily close for 30-60 minutes. The filter elements and canisters will be transported off site to an incinerator as described below.

Detonation of Unexploded Ordnance

Ordnance fragments are buried in soil in three areas of the facility (SWMU #1, SWMU #15 (Test Area 15), AOC #5 (Test Range 16) and are present in stockpiled soil in Area 1C. These items will be removed from the soil by trained ordnance personnel. The personell will evaluate

whether or not the ordnance fragment is safe for off-site transport. If the ordnance item cannot be safely transported off site, the item will be detonated on site as described below.

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan, 1999.

Analysis of Potential Impacts:

Excavation and Screening of Soil for Ordnance Fragments
Excavation and Removal of Culverts
Grading

These activities will be discussed together, because the potential impacts to human health are similar. The three activities will take place on site; and, since the nearest off-site human receptors are approximately 0 75 miles away, no impact on public health exists. The potential impacts are limited to on-site personnel only. The Health and Safety Plan describes several non-chemical hazards; these include 1) dust, 2) heat exposure, 3) noise, 4) fire/explosions, 5) vehicle traffic, and 6) biological hazards such as snakes, cattle, poison oak. The Health and Safety Plan specifies measures for on-site personnel to avoid these hazards. The measures include engineering controls/work practices, monitoring of ambient conditions, use of personal protective gear and supervision by trained personnel.

Excavation and Transport of Soil Contaminated with Explosive Chemicals

Excavation of contaminated soil includes the hazards mentioned above, with the addition of potential exposure to dust contaminated with explosive chemicals. The Health and Safety Plan includes measures for exposure to dust, including work practices and respiratory protection if ambient dust levels exceed 2 ug/M^3. Once excavated, the contaminated soil from will be loaded into land/sea shipping containers and transported off-site by tractor-trailer to an approved treatment, storage and disposal facility. Since the soil is, under ordinary circumstances, secure inside the container, the only possible exposure of the public to the soil during transport would be in the event of a traffic accident in which the container ruptured. If such a spill were to occur, local hazmat authorities would be notified and the spill cleaned up in a timely manner. Any resulting exposure of the public to the soil would be short-term. Based on the levels of explosives that would be present in the transported soil (80-150 ppm RDX, <29 mg/kg 1,3,5-trinitrobenzene), and known health effects of these chemicals, short term exposure of the public to this soil will not pose a health threat.

Excavation and Removal of CS-Containing Material

The Health and Safety Plan requires workers to use personal protective equipment to protect themselves form exposure to CS-containing material. Once excavated, the CS-containing material from SWMUs #2 and #9 will be transported off site in Department of Transportation (DOT) approved containers which would prevent the waste from escaping the container and impacting the environment. It is extremely unlikely that the DOT containers would rupture as the result of a traffic accident.

Detonation of Ordnance Fragments

If ordnance fragments require detonation to render them safe for off-site transport, the detonation will be performed at the Facility in a designated blasting area. The size of the charge that will be involved is approximately 10 pounds, and due to the fact that the facility is located 0.75 miles from the nearest residence or business, detonation of a charge of this magnitude does not have the potential to adversely impact the public. Detonation will be carried out by specially trained personnel.

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan, 1999
Yinon, 1990

Findings:

Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
☐	☐	☐	☒

15. Aesthetics (Workbook; page 38)

Description of Environmental Setting:

The property is undeveloped except for a limited number of buildings and structures formerly used for assembly and test operations.

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan, 1999.

Analysis of Potential Impacts:

This proposed project will not result in the obstruction of any scenic vista or view open to the public. The goal of the closure is to eventually release the property for future residential development. As such, the aesthetics of the Facility will be restored upon completion of closure activities. Efforts to protect sensitive habitats such as using existing haul roads, minimizing the volume of excavated material, storm water controls, site restoration, etc. will be made to minimize the impact of construction activities. Excavated areas will be backfilled with clean soil at minimum, and then graded and seeded with natural vegetation for erosion control dependent upon the proposed future uses of the unit.

To minimize impact to the site during closure activities, existing firebreak roads will be upgraded and utilized to handle construction equipment traffic. Upon completion of closure activities, the affected areas will be restored to their original condition as best as possible. It is anticipated that no new light or glare will be generated, no scenic vistas or views open to the public will be affected, and closure activities will not leave behind an aesthetically unpleasant site.

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan, 1999.

Findings:

Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
☐	☐	☐	☒

16 Cultural/ Paleontological Resources (Workbook; page 39)

Description of Environmental Setting:

No cultural or significant paleontological resources have been identified at the Facility since operations began in 1954. Since proposed closure activities involve areas which were previously developed by Aerojet, excavation activities are not expected to unearth previously unknown cultural, archeological, and/or paleontological resources.

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan, 1999.

Analysis of Potential Impacts:

This project does not involve, address, nor result in the alteration or destruction of prehistoric, historic, or archaeological structures or objects. A site inspection conducted at the project locations did not identify any such features. Furthermore, the project involves areas which have been previously developed, and prehistoric, historic, or archaeological structures and objects were not encountered.

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan, 1999.

Findings:

Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
☐	☐	☐	☒

17 Cumulative Effects (Workbook; page 42)

Description of Environmental Setting:

The proposed closures of the SWMUs/AOCs will be the third and final major remediation project conducted at the Facility since 1994. The first project involved the remediation of the OB/OD units. The project began in the Spring of 1994 and field work was completed in 1998. An Initial Study and Negative Declaration were prepared for the project and the project was public noticed in 1992 and approved in 1993. The second project for DU decommissioning and decontamination began in July 1996 and field work was completed in October 1997. This project was conducted under the regulatory oversight of the Radiologic Health Branch of the Department of Health Services.

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan, 1999

Analysis of Potential Impacts:

All three remediation projects involve soil excavation, soil screening to remove unexploded ordnance fragments, and off-site transport of soil contaminated with explosive chemicals. Soil impacted by explosive chemicals or unexploded ordnance was (or is) located in disturbed areas and not near or in sensitive habitat. Therefore, no cumulative impacts on wildlife occurred (or will occur). Two out of the three projects (the OB/OD Closure project and the proposed project) involved (or will involve) transport of soil contaminated with explosive chemicals off site. These projects are not being conducted simultaneously; therefore no cumulative risk to public health or the environment exists. All three projects involve some alteration of the earth's surface; however, the excavations were or will be backfilled with clean dirt and regraded, if necessary. No significant impacts to earth resulted or will result.

Findings:

Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
☐	☐	☐	☒

18 Population/Housing/Recreation (Workbook; page 43)

Description of Environmental Setting:

Other than the on-site soil remediation activities, the site and surrounding property are used for cattle grazing. There are between 5 and 10 oil wells currently operating on property surrounding the site

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan, 1999

Analysis of Potential Impacts:

Soil remediation activities will not affect population, housing or recreational facilities

Ref: McLaren/Hart Revised RFI Report, RFI Addendum Report, Corrective Measures Workplan, 1999

Findings:

Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
☐	☐	☐	☒

19 Mandatory Findings of Significance (Workbook; page 44)

	Potentially Significant Impact	*Potentially Significant Unless Mitigated*	*Less Than Significant Impact*	*No Impact*
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☒
b) Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?	☐	☐	☐	☒
c) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	☐	☐	☒	☐
d) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

V. DETERMINATION OF SIGNIFICANT EFFECT

On the basis of this Initial Study:

☒ I find that the proposed project COULD NOT have a significant effect on the environment. A NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project COULD HAVE a significant effect on the environment, mitigation measures have been added to the project which would reduce these effects to less than significant levels. A NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project COULD HAVE a significant effect on the environment. An ENVIRONMENTAL IMPACT REPORT will be prepared.

Preparer:

Christine P. Brown — Hazardous Substances Engineer

Original contains signature

Signature of Preparer — April 2, 1999 — Date

Supervisor:

Robert M. Senga — Unit Chief

Original contains signature

Signature of Supervisor — April 2, 1999 — Date

INITIAL STUDY
REFERENCE LIST
for
Aerojet Ordnance - Chino Hills

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8. McLaren/Hart 1995 Current Conditions Report and RCRA Facility Investigation Workplan at the Aerojet Chino Hills Facility, Volumes 1 and 2.

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16. RWQCB 1984 Santa Ana Basin Plan Regional Water Quality Control Board.

17 Shellooe. 1979. Preliminary Evaluation of State Water Program, Groundwater Storage Program: Chino Basin DWR Technical Information Record Study Code No. 1610-2-J-1

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24. Rhyne, W. R Hazardous Materials Transportation Risk Analysis Van Nostrand Reinhold, 1994

Table 1
Summary of RCRA Facility Investigation
Aerojet Chino Hills Facility

SWMU/ AOC	Area Identification	Remedial Measures Necessary (yes/no)	Chemically Impacted Soil (type)	Proposed Remedial Measures
SWMU #1	Former Burn Area "A"	yes	no	Explosive-containing fragments and dioxin Soil sifting proposed (3100 yd^3 soil) and excavation of dioxin contaminated soil (6 yd^3).
SWMU #2	Landfill	yes	no	CS or "tear gas" ventillation filters, lead and possible perchlorate source Excavation and removal of lead and perchlorate impacted soil. removal of ventillation filters.
SWMU #3	Former Ranch Culvert	no	no	No further action
SWMU #4	Former Buried 4,000-gal Tank	no	no	No further action
SWMU #5	Buried Con-X Building	no	no	No further action
SWMU #6	Former Caustic Ponds	no	no	No further action
SWMU #7	Former Redwater Pond	yes	yes (RDX & 1,3,5-TNB)	Explosive-related chemicals in soil and subsurface water. Soil excavation (3000 yd^3) and subsurface water removal proposed.
SWMU #8	Former HEI Pond	yes	yes (RDX)	Explosive-related chemicals. Soil excavation proposed (400 yd^3 soil)
SWMU #9	Burn Area 18	yes	no	CS or "tear gas" Excavation and removal of cannisters proposed.
SWMU #10A	Ordnance Fuse Test Unit	no	no	No further action
SWMU #11	Former Drop Towers	no	no	No further action
SWMU #12	Former Drum Storage Area	no	no	No further action
SWMU #13	Former Detonation Box	no	no	No further action.
SWMU #14	Building 037	no	no	No further action.
SWMU #15	Test Area 15	yes	no	Explosive-containing fragments Soil sifting proposed (250 yd^3 soil).
	Upper A-12 Test Area	maybe		Perchlorate at 887 ug/L detected in subsurface water.

SWMU/AOC Solid Waste Management Unit/Area of Concern

Table 1
Summary of RCRA Facility Investigation
Aerojet Chino Hills Facility

SWMU/ AOC	Area Identification	Remedial Measures Necessary (yes/no)	Chemically Impacted Soil (type)	Proposed Remedial Measures
SWMU #16	Building 011 and 012	no	no	No further action
AOC #1	Waste Explosive Storage Magazine	no	no	No further action.
AOC #2	Hazardous Waste Storage Area	no	no	No further action.
AOC #3	Former Burn Area 19	no	no	No further action.
AOC #4	Lake Aerohead	no	no	No further action.
AOC #5	Test Range 16	yes	yes (RDX)	Explosive-related chemicals (300 yd^3 soil) and explosive-containing fragments. (1900 yd^3 soil).
	Test Area 14	no	no	No further action
	Test Area 17	yes	no	Remove buried culvert
AOC #6	Test Range 1C	yes	no	Explosive-containing fragments (31,500 yd^3 soil).
	Test Area 20	no	no	No further action
AOC #7	Test Range 7D	yes	yes (RDX)	Explosive-related chemicals. Excavate 10 yd^3 soil
AOC #8	Building 010	no	no	No further action
AOC #9	Test Area 7 & 7B	yes	yes (RDX)	Explosive-related chemicals. Excavate 1 yd^3 soil. Remove 10 buried culverts.
AOC #10	Metal Forming Area	no	no	No further action
AOC #11	Chemical Test Area	no	no	No further action.
AOC #12	Arena Test Area	yes	no	Explosive-containing fragments (700 yd^3 soil).
AOC #13	Three-Tier Test Area	no	no	No further action

SWMU/AOC Solid Waste Management Unit/Area of Concern

Attachment 1

Calculations for Air Emissions

Calculations for removal of Below Ground Culverts from AOC #5 and AOC #9

This activity will involve emissions from the following off-road vehicles: excavator, bulldozer, grader, water truck.

Emissions (lb emitted per day) from off road vehicles are as follows:

Emissions Formula: E = EF x H x N

where E = Emissions in lb/day
EF = emissions factor (see below)
H = 8 hours/day of operation
N = Number of vehicles

Assume all vehicles are diesel powered
Duration of activity = 3 days (1 day each culvert)
PM_{10} emissions from dirt handling are assumed negligible due to less than 10 cubic yards of soil handled per excavation

Excavator and Grader:

Reactive organic gases: 2 vehicles x 1.1 gm/HP-hr x 168 HP x 8 hr/day /453.59gm/lb = 6.52 lb./day

carbon monoxide: 2 vehicles x 3.4gm/HP-hr x 168 HP x 8 hr/day /453.59gm/lb = 20.14 lb/day

nitrogen oxides: 2 vehicles x 11gm/HP-hr x 168 HP x 8 hr/day /453.59 gm/lb = 65.18 lb/day

PM_{10}: 2 vehicles x 0.7 gm/HP-hr x 168 HP x 8 hr/day /453.59 gm/lb = 4 14 lb/day

Bulldozer:

reactive organic gases: 1.0 gm/HP-hr x 285 HP x 8 hr/day /453.59 gm/lb = 5.03 lb/day

carbon monoxide: 2.8 gm/HP-hr x 285 HP x 8 hr/day /453.59 gm/lb = 14 07 lb/day

nitrogen oxides: 12 gm/HP-hr x 285 HP x 8 hr/day /453.59 gm/lb = 60.32 lb/day

PM_{10}: 0.6 x 285 HP x 8 hr/day /453.59 gm/lb = 3.02 lb/day

Water Truck:

reactive organic gases: 1.0 gm/HP-hr x 185 HP x 8 hr/day /453.59 gm/lb = 3.3 lb/day

carbon monoxide: 2.8 gm/HP-hr x 185 HP x 8 hr/day /453.59 gm/lb = 9.1 lb/day

nitrogen oxides: 12 gm/HP-hr x 185 HP x 8 hr/day /453.59 gm/lb = 39.2 lb/day

PM_{10}: 0.6 gm/HP-hr x 185 HP x 8 hr/day /453.59 gm/lb = 2.0 lb/day

Total emissions are 14.85 lb/day of reactive organic gases, 43.3 lb/day of carbon monoxide, 164.7 lb/day of nitrogen oxides, and 9.2 lb/day of PM_{10}.

Calculation of Emissions from Soil Excavation, Mechanical Screening

This activity will involve emissions from off road vehicles and PM_{10} emissions from dirt handling. The following off road vehicles will be used:

Vehicle	Duration of Use (Weeks)
Excavator	3
bulldozer	1
front-end loader (2 vehicles)	11
backhoe	1
Water truck	11
Dump truck (3 vehicles)	1
Power Generator	11

Approximately 610 tons dirt/day will be processed through the mechanical screening plant. Total emissions will be calculated on a time-weighted basis. Duration of vehicle use information is taken from Table 11-1 of the Corrective Measures Workplan

Emissions (lb emitted per day) from off road vehicles are as follows:

Emissions Formula: E = EF x H x N

where E = Emissions in lb/day
EF = emissions factor (see below)
H = 8 hours/day of operation
N = Number of vehicles

Assume all vehicles are diesel powered

Excavator:

Reactive organic gases: 1.1 gm/HP-hr x 168 HP x 8 hr/day /453.59gm/lb = 3.26 lb /day

carbon monoxide: 3.4gm/HP-hr x 168 HP x 8 hr/day /453.59gm/lb = 10.07 lb/day

nitrogen oxides: 11gm/HP-hr x 168 HP x 8 hr/day /453.59 gm/lb = 32.59 lb/day

PM_{10}: 0.7 gm/HP-hr x 168 HP x 8 hr/day /453.59 gm/lb = 2.07 lb/day

Bulldozer:

reactive organic gases: 1.0 gm/HP-hr x 285 HP x 8 hr/day /453.59 gm/lb = 5.03 lb/day

carbon monoxide: 2.8 gm/HP-hr x 285 HP x 8 hr/day /453.59 gm/lb = 14.07 lb/day

nitrogen oxides: 12 gm/HP-hr x 285 HP x 8 hr/day /453.59 gm/lb = 60.32 lb/day

PM_{10}: 0.6 x 285 HP x 8 hr/day /453.59 gm/lb = 3.02 lb/day

Front loader:

reactive organic gases: 2 vehicles x 1.1 gm/HP-hr x 140 HP x 8 hr/day /453.59 gm/lb = 5.5 lb/day

carbon monoxide: 2 vehicles x 3.4 gm/HP-hr x 140 HP x 8 hr/day /453.59 gm/lb = 16.8 lb/day

nitrogen oxides: 2 vehicles x 11 gm/HP-hr x 140 HP x 8 hr/day /453.59 gm/lb = 54.3 lb/day

PM_{10}: 2 vehicles x 0.7 gm/HP-hr x 140 HP x 8 hr/day /453.59 gm/lb = 3.5 lb/day

Backhoe:

reactive organic gases: 1.2 gm/HP-hr x 74 HP x 8 hr/day /453.59 gm/lb = 1.57 lb/day

carbon monoxide: 4.0 gm/HP-hr x 74 HP x 8 hr/day /453.59 gm/lb = 5.22 lb/day

nitrogen oxides: 11 gm/HP-hr x 74 HP x 8 hr/day /453.59 gm/lb = 14.36 lb/day

PM_{10}: .8 gm/HP-hr x 74 HP x 8 hr/day /453.59 gm/lb = 1.04 lb/day

1 Water Truck + 3 Dump Trucks (both vehicles are 185 HP):

reactive organic gases: 4 trucks x 1.0 gm/HP-hr x 185 HP x 8 hr/day /453.59 gm/lb = 13.05 lb/day

carbon monoxide: 4 trucks x 2.8 gm/HP-hr x 185 HP x 8 hr/day /453.59 gm/lb = 36.54 lb/day

nitrogen oxides: 4 trucks x 12 gm/HP-hr x 185 HP x 8 hr/day /453.59 gm/lb = 156.62 lb/day

PM_{10}: 4 trucks x 0.6 gm/HP-hr x 185 HP x 8 hr/day /453.59 gm/lb = 7.83 lb/day

Power Generator:

reactive organic gases: 1.3 gm/HP-hr x 40 HP x 8 hr/day /453.59 gm/lb = .92 lb/day

carbon monoxide: 4.5 gm/HP-hr x 40 HP x 8 hr/day /453.59 gm/lb = 3.18 lb/day

nitrogen oxides: 10 gm/HP-hr x 40 HP x 8 hr/day /453.59 gm/lb = 7.06 lb/day

PM_{10}: .8 gm/HP-hr x 40 HP x 8 hr/day /453.59 gm/lb = .56 lb/day

Emissions from Dirt Handling:

$E = [0.0012 \times (W/5)^{1.3} / (H/2)^{1.4}] \times T$ (Table 9-9-G, CEQA Air Quality Handbook)

where E = emissions of PM_{10}
W = wind speed, assume light wind in summer of 5 miles per hour
H = moisture content of soil, assume 15% (0.15) lightly moistened with water for dust suppression purposes.
T = tons dirt handled per day, assume 610 tons (800 cubic yards)

$E = [0.0012 \times (5/5)^{1.3} / (.15/2)^{1.4}] \times 610 = 27.5$ lb PM_{10} / day

Eight-hour emissions/day from soil excavation and mechanical screening are summarized as follows:

vehicle	time fraction	8-hr emissions (ROG)	8-hr emissions (CO)	8-hr emissions (NOx)	8-hr emissions (PM_{10})
excavator	3/11	3 26	10.07	32 59	2 07
bulldozer	1/11	5 03	14.7	60 32	3 02
front-end loader (2 vehicles)	11/11	5 5	16 8	54 3	3 5
backhoe	1/11	1 57	5 22	14.36	1 04
water truck	11/11	3 26	9 14	39 15	1 96
dump truck	1/11	0 89	27 40	127 46	5 87
power generator	11/11	0 92	3 18	7 06	0 56
Dirt handling (PM_{10} only)	11/11	---	---	---	27 5
Totals		20.43	86.51	335.24	45.52

Time-weighted (8-hr x time fraction) emissions/day from soil excavation and mechanical screening are as follows:

vehicle	time fraction	time-weighted emissions (ROG)	time-weighted emissions (CO)	time weighted emissions (NOx)	time-weighted emissions (PM_{10})
excavator	3/11	0 89	2 75	8 89	0 56
bulldozer	1/11	0.46	1.28	5.48	0.27

front-end loader (2 vehicles)	11/11	5.50	16 8	54.3	3.50
backhoe	1/11	0.14	0.47	1 30	0.09
water truck	11/11	3.26	9.14	39 16	1.96
dump truck	1/11	0 89	2 49	10.68	0 53
power generator	11/11	0 92	3.18	7 06	0 56
Dirt handling (PM_{10} only)	11/11	---	---	---	27.5
Totals		12.06	36.1	126.87	35.0

Emissions from excavation and off site disposal of chemically impacted soil

This activity is expected to last for approximately 12 days Approximately 625 tons/day of dirt will be handled

PM_{10} Emissions from loading contaminated soil on trucks:

$E = [0\ 0012 \times (W/5)^{1\ 3} / (H/2)^{1\ 4}] \times T$ (Table 9-9-G, CEQA Air Quality Handbook)

where E = emissions of PM_{10}
W = wind speed, assume light wind in summer of 5 miles per hour
H = moisture content of soil, assume 15% (0 15) lightly moistened with water for dust suppression purposes
T = tons dirt handled per day, assume 25 tons/truck x 25 trucks = 625 tons

$E = .0012/(.15/2)^{1\ 4} \times 625 = 28\ 2$ lb/day

Emissions from dirt-hauling trucks

Assume trucks carrying contaminated soil off site are diesel powered:
Assume 25 trucks/day
Assume 20 mile trip to and from rail location at avg speed of 25 mph

reactive organic gases: 1.88 gm/mile x 20 miles x 25 trucks/day /453.59 gm/lb = 2.07 lb/day

carbon monoxide: 10.27 gm/mile x 20 miles x 25 trucks/day /453.59 gm/lb = 11.32 lb/day

nitrogen oxides: 10.81 gm/mile x 20 miles x 25 trucks/day /453.59 gm/lb = 11.92 lb/day

PM_{10}: 0.88 gm/mile x 20 miles x 25 trucks/day /453.59 gm/lb = .97 lb/day

Total emissions/day from excavation and off site disposal of chemically impacted soil are 2.07 lb/day of reactive organic gases, 11.32 lb/day of carbon monoxide, 11.92 lb/day of nitrogen oxides, and 29.2 lb/day of PM_{10}.

Emissions from excavation of soil and segregation of CS-containing material

This activity will use the following off-road vehicles: backhoe, water truck. A portable screening plant (which requires a generator) will also be used. Assume 610 tons/dirt (800 cubic yards) handled per day, (limited by capacity of the portable screening plant.)

Backhoe:

reactive organic gases: 1.2 gm/HP-hr x 74 HP x 8 hr/day /453.59 gm/lb = 1.57 lb/day

carbon monoxide: 4.0 gm/HP-hr x 74 HP x 8 hr/day /453.59 gm/lb = 5.22 lb/day

nitrogen oxides: 11 gm/HP-hr x 74 HP x 8 hr/day /453.59 gm/lb = 14.36 lb/day

PM_{10}: .8 gm/HP-hr x 74 HP x 8 hr/day /453.59 gm/lb = 1.04 lb/day

Water Truck:

reactive organic gases: 1.0 gm/HP-hr x 185 HP x 8 hr/day /453.59 gm/lb = 3.26 lb/day

carbon monoxide: 2.8 gm/HP-hr x 185 HP x 8 hr/day /453.59 gm/lb = 9.14 lb/day

nitrogen oxides: 12 gm/HP-hr x 185 HP x 8 hr/day /453.59 gm/lb = 39.2 lb/day

PM_{10}: 0.6 gm/HP-hr x 185 HP x 8 hr/day /453.59 gm/lb = 2.0 lb/day

Power Generator:

reactive organic gases: 1.3 gm/HP-hr x 40 HP x 8 hr/day /453.59 gm/lb = 92 lb/day

carbon monoxide: 4.5 gm/HP-hr x 40 HP x 8 hr/day /453.59 gm/lb = 3.18 lb/day

nitrogen oxides: 10 gm/HP-hr x 40 HP x 8 hr/day /453.59 gm/lb = 7.06 lb/day

PM_{10}: 8 gm/HP-hr x 40 HP x 8 hr/day /453.59 gm/lb = .56 lb/day

PM_{10} Emissions from dirt handling:

$E = [0.0012 \times (W/5)^{1.3} / (H/2)^{1.4}] \times T$ (Table 9-9-G, CEQA Air Quality Handbook)

where E = emissions of PM_{10}
W = wind speed, assume light wind in summer of 5 miles per hour
H = moisture content of soil, assume 15% (0.15) lightly moistened with water for dust suppression purposes.
T = tons dirt handled per day, 610 tons (800 cubic yards)

$E = .0012/(.15/2)^{1.4} \times 610 = 27.5$ lb/day

Total emissions/day from excavation/processing of CS-impacted soil are 5.75 lb/day of reactive organic gases, 15.5 lb/day of carbon monoxide, 60.6 lb/day of nitrogen oxides, and 30.1 lb/day of PM_{10}.

Emissions from landfill or Test Range 1C grading:

The following off road vehicles will be used: bulldozer (2 vehicles), excavator, water truck. This activity is expected to last approximately four days.

Bulldozer:

reactive organic gases: 2 vehicles x 1.0 gm/HP-hr x 285 HP x 8 hr/day /453.59 gm/lb = 10.06 lb/day

carbon monoxide: 2 vehicles x 2.8 gm/HP-hr x 285 HP x 8 hr/day /453.59 gm/lb = 28.14 lb/day

nitrogen oxides: 2 vehicles x 12 gm/HP-hr x 285 HP x 8 hr/day /453.59 gm/lb = 120.64 lb/day

PM_{10}: 2 vehicles x 0 6 x 285 HP x 8 hr/day /453 59 gm/lb = 6 04 lb/day

Excavator:

Reactive organic gases: 1 1 gm/HP-hr x 168 HP x 8 hr/day /453 59gm/lb = 3 26 lb /day

carbon monoxide: 3 4gm/HP-hr x 168 HP x 8 hr/day /453 59gm/lb = 10 07 lb/day

nitrogen oxides: 11gm/HP-hr x 168 HP x 8 hr/day /453 59 gm/lb = 32 59 lb/day

PM_{10} : 0 7 gm/HP-hr x 168 HP x 8 hr/day /453 59 gm/lb = 2 07 lb/day

Water Truck:

reactive organic gases: 1 0 gm/HP-hr x 185 HP x 8 hr/day /453 59 gm/lb = 3 26 lb/day

carbon monoxide: 2 8 gm/HP-hr x 185 HP x 8 hr/day /453 59 gm/lb = 9 14 lb/day

nitrogen oxides: 12 gm/HP-hr x 185 HP x 8 hr/day /453 59 gm/lb = 39 2 lb/day

PM_{10}: 0 6 gm/HP-hr x 185 HP x 8 hr/day /453 59 gm/lb = 2 0 lb/day

PM_{10} emissions from dirt handling:

$E = [0.0012 \times (W/5)^{1.3} / (H/2)^{1.4}] \times I$ (Table 9-9-G, CEQA Air Quality Handbook)

where E = emissions of PM_{10}
W = wind speed, assume light wind in summer of 5 miles per hour
H = moisture content of soil, assume 15% (0 15) lightly moistened with water for dust suppression purposes
I = tons dirt handled per day, 1875 tons

$E = .0012 (15/2)^{1.4} \times 1875 = 84.6$ lb/day

Total emissions/day for grading are 16 58 lb/day of reactive organic gases, 47 35 lb/day of carbon monoxide, 192 43 lb/day of nitrogen oxides, and 94 7 lb/day of PM_{10}

Emissions from passenger automobiles:

assume 10 cars/day, avg speed = 25 mph, all cars have catalytic converters, avg Round trip = 40 miles, duration of project is 6 months

reactive organic gases: 10 cars/day x 0.31 gm/mile x 40 miles /453.59 gm/lb = 0.27 lb/day

carbon monoxide: 10 cars/day x 5.16 gm/mile x 40 miles / 453.59 gm/lb = 4.55 lb/day

nitrogen oxides: 10 cars/day x 0 56 gm/mile x 40 miles /453.59 gm/lb = 0.49 lb/day

PM_{10}: 10 cars/day x .01 gm/mile x 40 miles /453 59 gm/lb = .0088 lb/day

FIGURE 1
REGIONAL MAP AND
SENSITIVE RECEPTOR LOCATIONS
AEROJET CHINO HILLS FACILITY
CHINO HILLS, CA

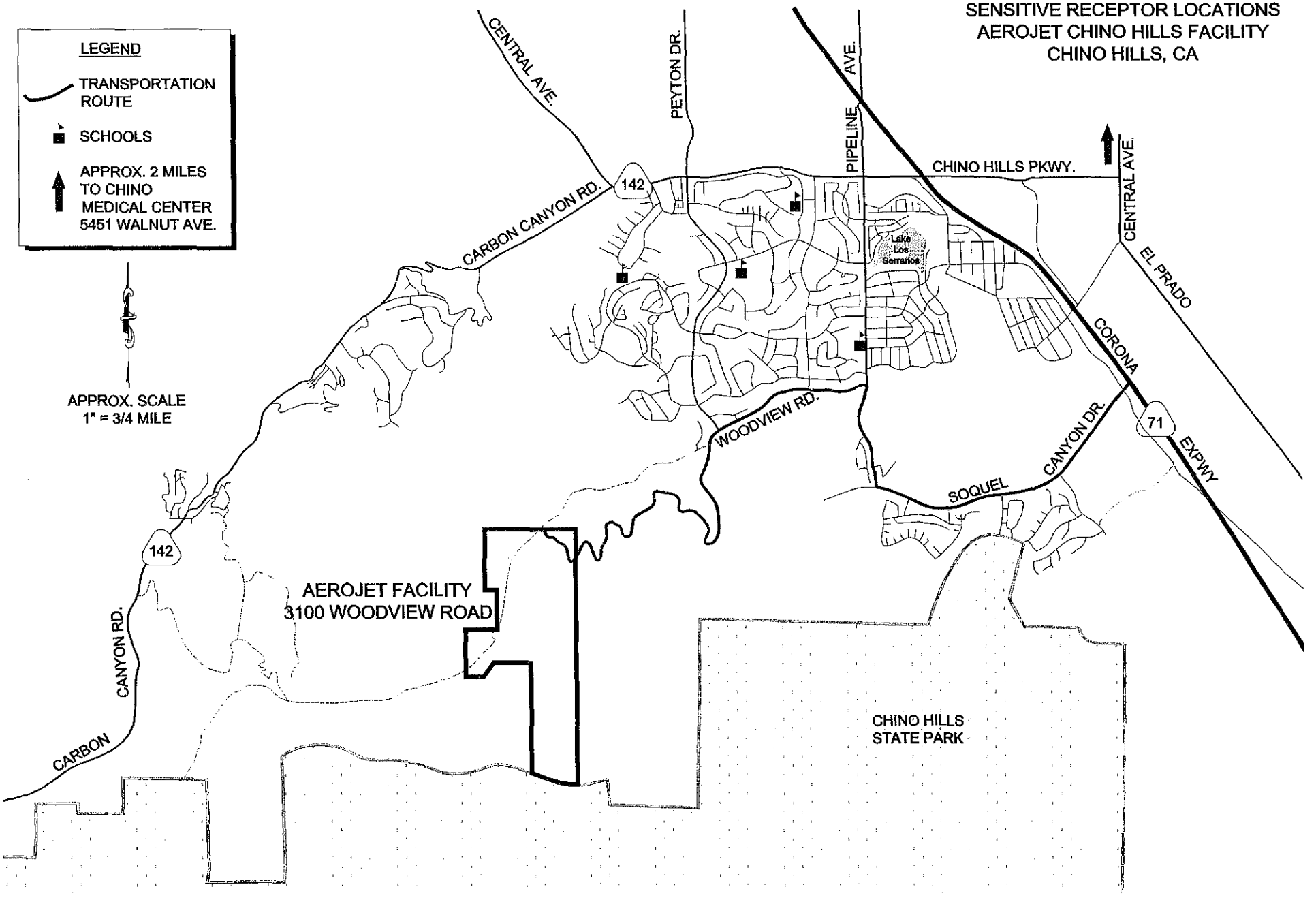

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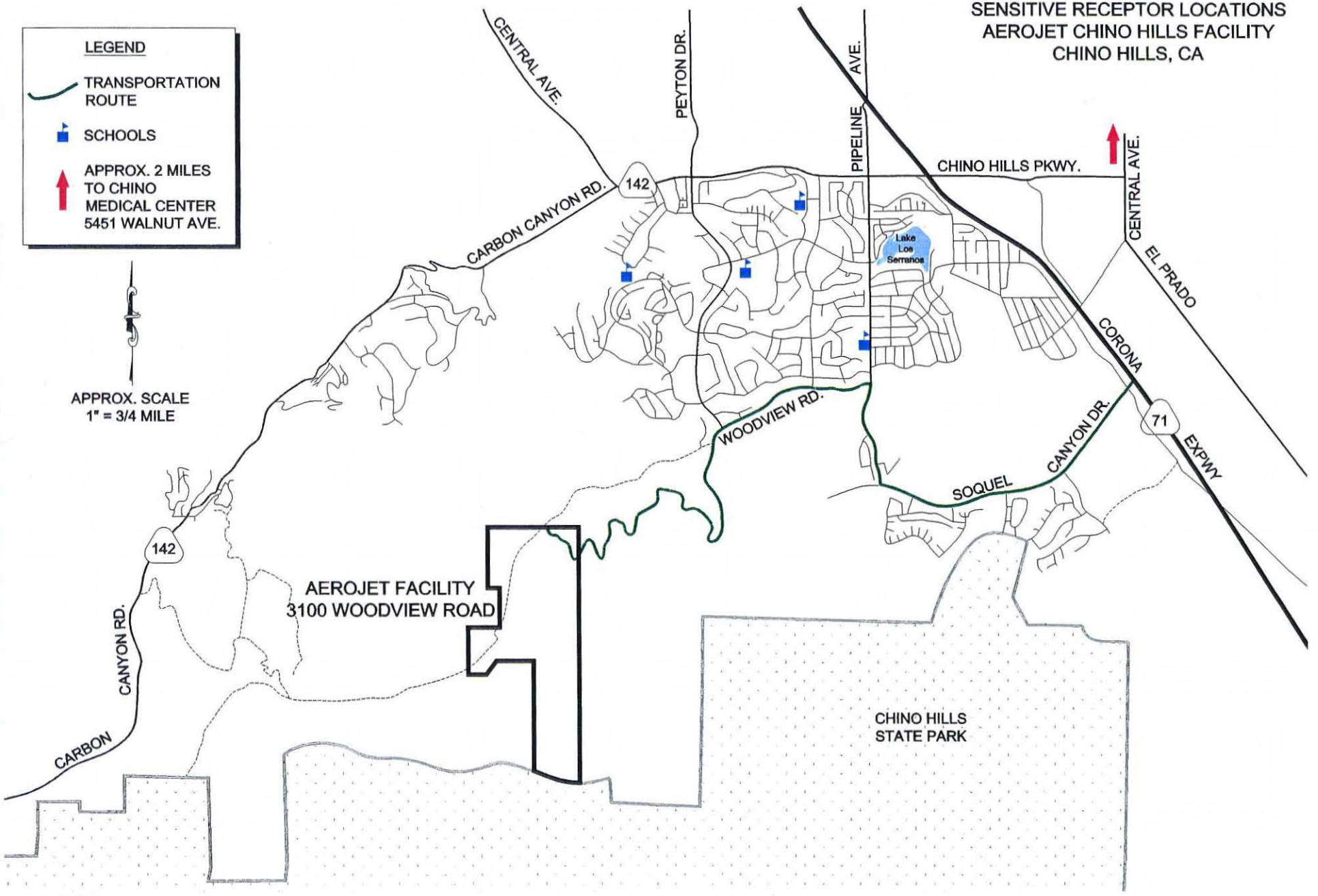
FIGURE 1
REGIONAL MAP AND
SENSITIVE RECEPTOR LOCATIONS
AEROJET CHINO HILLS FACILITY
CHINO HILLS, CA



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